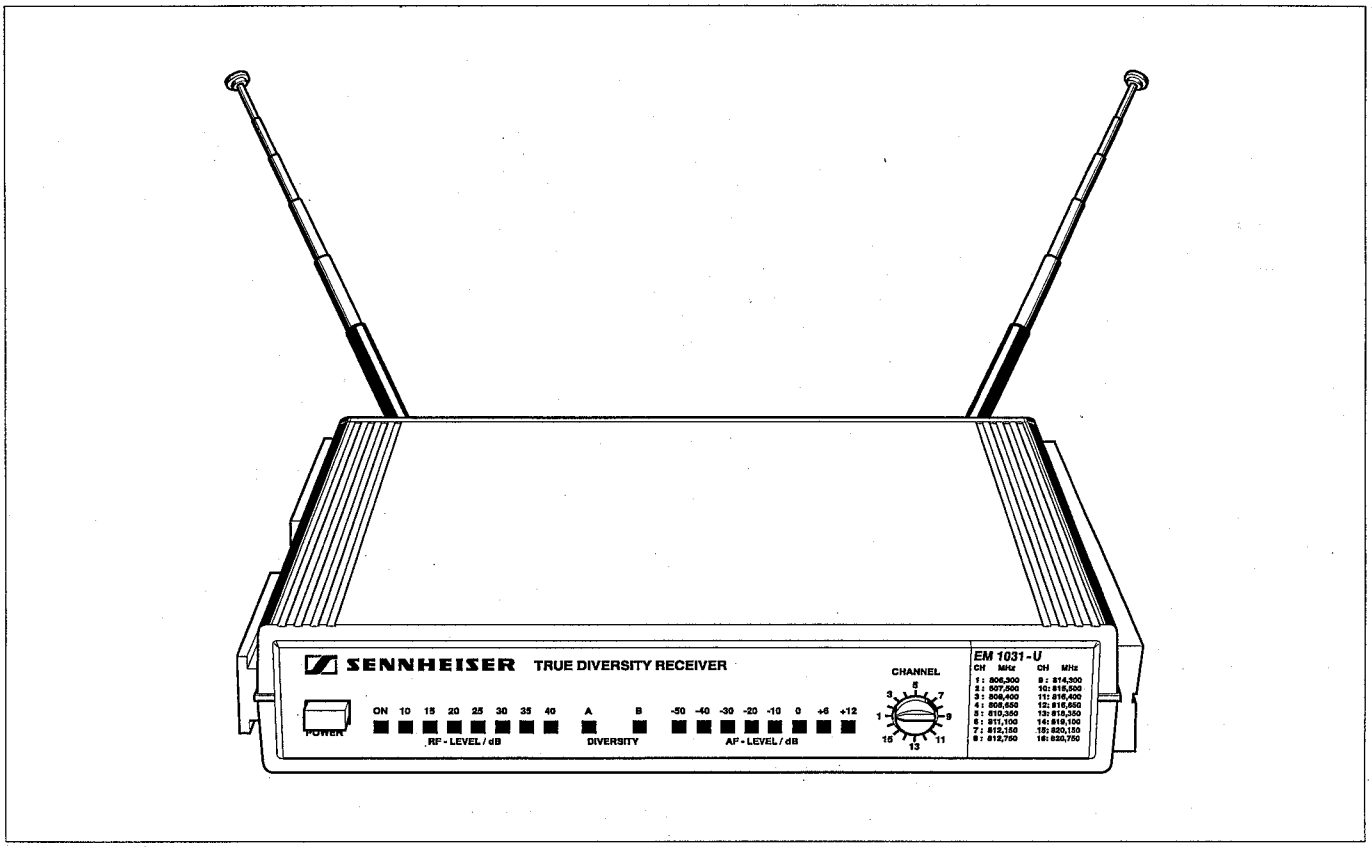
SENNHEISER
Service

EM 1031-U



KURZBESCHREIBUNG

Leistungsfähiger und kompakter True-Diversity-Empfänger mit hohem Bedienungskomfort. Passend zu Handsender BF 1081-U / SKM 1072-U und Taschensender BF 1083-U / SK 1063-U.

MERKMALE

- Störungsfreier Betrieb durch True-Diversity-Technik
- Wirksame Rauschunterdrückung und hohe Dynamik durch HiDyn*plus*
- Vorbereitet für den Einbau in 19" Rack, 1 HE
- Betrieb durch Steckernetzteil oder am 12 V-KFZ-Netz
- Umschaltbar auf 16 Empfangsfrequenzen

BRIEF DESCRIPTION

Compact, powerful and easy-to-operate true diversity receiver. For use with the BF 1081-U / SKM 1072-U hand-held transmitter or the BF 1083-U / SK 1063-U body-pack transmitter.

FEATURES

- True diversity receiver ensures reliable operation
- HiDyn*plus* noise suppression system gives excellent dynamic range
- Suitable for 19" rack installation, 1 U high
- Power supply via plug-in mains unit or external 12 V DC
- Switchable to 16 frequencies

Sicherheitsvorschriften / Safety requirements/ Prescrizioni de sicurezza / Prescriptions de sécurité / Prescripciones de seguridad

Deutsch

Achtung: Bei Eingriffen in das Gerät sind die Sicherheitsvorschriften nach VDE 701 (reparaturbezogen) bzw. VDE 0860 / IEC 65 (gerätebezogen) zu beachten !

Bauteile nach IEC- bzw. VDE-Richtlinien ! Im Ersatzfall nur Teile mit gleicher Spezifikation verwenden !

MOS - Vorschriften beim Umgang mit MOS - Bauteilen beachten !

English

Attention: Please observe the applicable safety requirements according to VDE 701 (concerning repairs) and VDE0860 / IEC 65 (concerning type of product) !

Components to IEC or VDE guidelines ! Only use components with the same specifications for replacement !

Observe MOS components handling instructions when servicing !

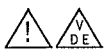
Italiano

Attenzione: Osservarne le corrispondenti prescrizioni di sicurezza VDE 701 (concernente servizio) e VDE 0860 / IEC 65 (concernente il tipo di prodono) !

Componenti secondo le norme VDE risp. te IEC ! In caso di sostituzione impiegare solo componenti con le stesse caratteristiche.

Osservare le relative prescrizioni durante, lavori con componenti MOS !

Français

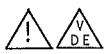


Attention: Prière d'observer les prescriptions de sécurité VDE701 (concernant les réparations) et VDE 0860 / IEC 65 (concernant le type de produit) !

Composants répondant aux normes VDE ou IEC. Les remplacer uniquement par des composants ayant les memes spécifications.

Lors de la manipulation des circuits MOS, respecter les prescriptions MOS !

Español



Atención: Recomendamos las normas de seguridad VDE u otras normas equivalentes, por ejemplo: VDE 701 para reparaciones, VDE 0860 / IEC 65 para aparatos !

Componentes que cumplen las normas VDE / IEC. En caso de sustitución, emplear componentes con idénticas especificaciones !

Durante la reparacion observar las normas sobre componentes MOS !

USA & Canada

Attention: This set can only be operated from AC mains of 120V / 60Hz. Also observe the information given on the rear of the set !

CAUTION: For continued protection against risk of fire replace only with same type fuses!
CAUTION: To reduce the risk of electric shock, do not remove cover (or back), no user-serviceable parts inside,refer servicing to qualified service personnel.

Components to safety guidelines (IEC / U.L.) ! Only use components with the same specifications for replacement !

Observe by checking leakage-current or resistance measurement that the exposed parts are acceptably insulated from the supply circuit.

Observe MOS components handling instructions when servicing !

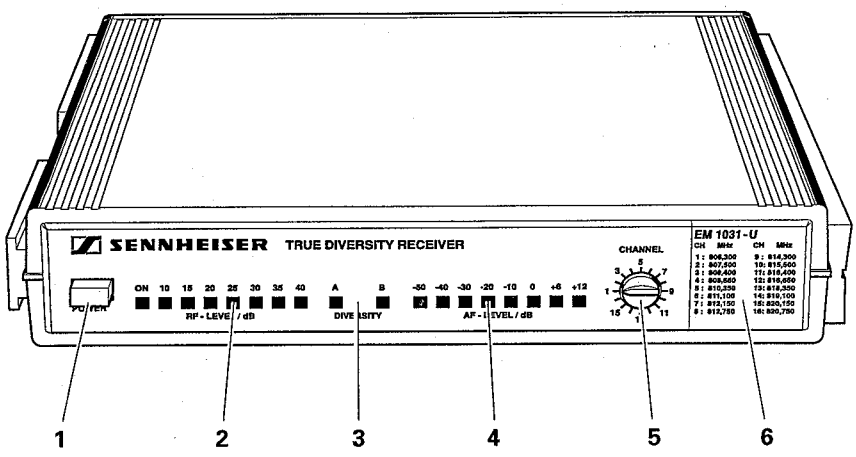
INHALTSVERZEICHNIS

		SEITE
1	**BEDIENUNGSELEMENTE**	**4**
1.1	FRONTSEITE	4
1.2	RÜCKSEITE	4
2	**TECHNISCHE DATEN**	**5**
3	**ALLGEMEINES**	**6**
3.1	INHALT DER SERVICE-ANLEITUNG	6
3.2	SERVICE-KONZEPT	6
4	**MESSGERÄTE UND PRÜFMITTEL**	**7**
4.1	SPEZIELLE SERVICE-HILSMITTEL	7
4.2	SERVICE-SET SEPT1	7
5	**SERVICE HINWEISE**	**8**
5.1	ALLGEMEINES ÜBERPRÜFEN	8
5.2	EMPFANGSEIGENSCHAFTEN ÜBERPRÜFEN	8
5.3	ABGLEICH UND FEHLERSUCHE	9
6	**FREQUENZÄNDERUNGEN**	**9**
6.1	PROGRAMMIERUNG	9
6.2	FUNKTIONSÜBERPRÜFUNG	10
7	**PRÜF- UND ABGLEICHANWEISUNG**	**11**
7.1	MESSAUFBAU	11
7.2	ABGLEICHELEMENTE, MESSPUNKTE	12
7.3	PRÜF- UND ABGLEICHANWEISUNG	13
8	**SCHALTUNTERLAGEN**	**19**
8.1	BLOCKSCHALTBILD	19
8.2	STROMLAUFPLAN, HF-TEIL	20
8.3	STROMLAUFPLAN, PLL	21
8.4	STROMLAUFPLAN, NF-TEIL	22
8.5	GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE	23
8.6	GEDRUCKTE SCHALTUNG, LÖTSEITE	24
9	**EXPLOSIONSZEICHNUNG**	**25**
10	**ERSATZTEILE**	**26**

CONTENTS

		PAGE
1	**OPERATING ELEMENTS**	**4**
1.1	FRONT SIDE	4
1.2	REAR SIDE	4
2	**TECHNICAL DATA**	**5**
3	**GENERAL**	**6**
3.1	CONTENTS OF THIS SERVICE MANUAL	6
3.2	SERVICING	6
4	**MEASURING AND TEST EQUIPMENT**	**7**
4.1	SPECIAL SERVICE TOOLS	7
4.2	SEPT1 SERVICE-SET	7
5	**SERVICE INSTRUCTIONS**	**8**
5.1	GENERAL TEST	8
5.2	RECEPTION TEST	8
5.3	ALIGNMENT AND TROUBLESHOOTING	9
6	**CHANGING THE FREQUENCIES**	**9**
6.1	PROGRAMMING	9
6.2	FUNCTIONAL TEST	10
7	**TEST AND ALIGNMENT INSTRUCTIONS**	**11**
7.1	TEST SET-UP	11
7.2	ADJUSTER LOCATION, TEST POINTS	12
7.3	TEST AND ALIGNMENT INSTRUCTIONS	16
8	**SCHEMATICS**	**19**
8.1	BLOCK DIAGRAM	19
8.2	CIRCUIT DIAGRAM, RF SECTION	20
8.3	CIRCUIT DIAGRAM, PLL	21
8.4	CIRCUIT DIAGRAM, AF SECTION	22
8.5	PRINTED CIRCUIT BOARD, COMPONENT SIDE	23
8.6	PRINTED CIRCUIT BOARD, SOLDER SIDE	24
9	**EXPLODED VIEW**	**25**
10	**SPARE PARTS**	**26**

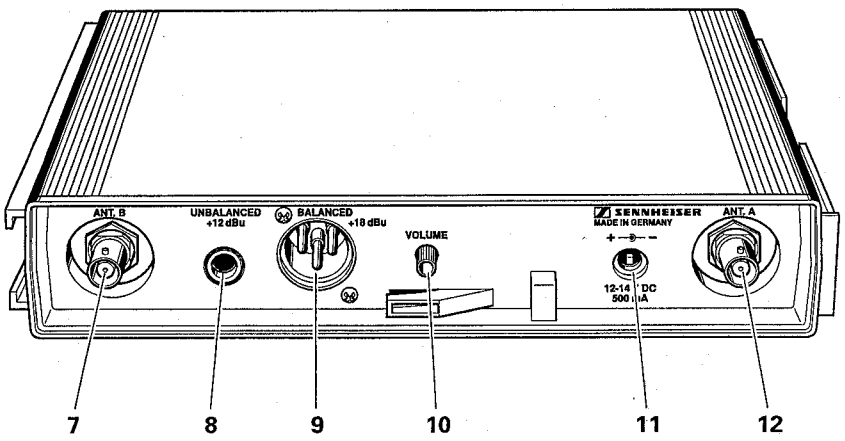
1 BEDIENUNGSELEMENTE



1 EIN / AUS - Schalter (POWER)
2 Anzeige des HF - Pegels (RF - LEVEL)
3 Anzeige des aktiven Diversity - Kanals (DIVERSITY)
4 Anzeige des Tonsignalpegels (AF - LEVEL)
5 Kanalwahlschalter (CHANNEL 1 - 16)
6 Typenschild mit Kanal und Frequenzangabe

1 OPERATING ELEMENTS

1 ON / OFF switch (POWER)
2 RF level indicator (RF - LEVEL)
3 Indicator showing the active diversity channel (DIVERSITY)
4 AF level indicator (AF - LEVEL)
5 Channel selector (CHANNEL 1 - 16)
6 Type plate with channel and frequency



7 Antenneneingang B für Diversity - Betrieb (BNC)
8 NF - Ausgang, unsymmetrisch, 6,3 mm ø Klinke (LINE)
9 NF - Ausgang, symmetrisch, XLR - 3
10 Einstellung NF - Ausgangspegel (wirkt auf beide Ausgänge)
11 Anschlußbuchse für Stromversorgung (Steckernetzteil)
12 Antenneneingang A für Diversity - Betrieb (BNC)

7 Antenna connector B for diversity operation (BNC)
8 AF output, unbalanced, 6.3 mm jack (LINE)
9 AF output, balanced, XLR - 3
10 Volume control (for both outputs)
11 DC input socket for connecting the plug-in mains unit)
12 Antenna connector A for diversity operation (BNC)

2 TECHNISCHE DATEN

Empfänger	2 Kanal Diversity, Superhet
Empfangsfrequenzen	UHF-Bereich 574 - 960 MHz (3 Bereiche)
Schaltbandbreite	ca. 27 MHz
Kanäle	16, umschaltbar
Empfindlichkeit (100 dB Geräuschspannungsabstand)	< 5 µV
Modulation	FM
Deemphasis	50 µs
Nennhub bei 1 kHz	± 40 kHz
Spitzenhub bei 1 kHz	± 56 kHz
1. Zwischenfrequenz	65,75 MHz
2. Zwischenfrequenz	10,7 MHz
Ausgang symm. XLR - 3 (bei Spitzenhub)	5 V_{eff} einstellbar an 1000 Ω
Ausgang unsym., 6,3 mm ø (bei Spitzenhub)	2,5 V_{eff} einstellbar an 1000 Ω
Rauschunterdrückungssystem	HiDyn*plus*
Geräuschspannungsabstand	120 dB (A)
Klirrfaktor (1 kHz und Nennhub)	< 1 %
Übertragungsbereich	40 - 20000 Hz
Rauschsperre	1,5 µV
Abmessungen in mm	213 x 145 x 44
Gewicht	ca. 700 g
Steckernetzteil	120 / 230 / 240 V AC ± 10 %

2 TECHNICAL DATA

Receiver	2-channel diversity superheterodyne
Frequencies	UHF band 574 - 960 MHz (3 ranges)
Switching bandwidth	approx. 27 MHz
Channels	16, switchable
Sensitivity (100 dB Signal-to-noise ratio)	< 5 µV
Modulation	FM
Deemphasis	50 µs
Nominal deviation at 1 kHz	± 40 kHz
Peak deviation at 1 kHz	± 56 kHz
1st intermediate frequency	65.75 MHz
2nd intermediate frequency	10.7 MHz
Output, balanced, XLR - 3 (at peak deviation)	5 V_{eff}, adjustable at 1000 Ω
Output, unbalanced, 6.3 mm jack (at peak deviation)	2.5 V_{eff}, adjustable at 1000 Ω
Compander	HiDyn*plus*
Signal-to-noise ratio	120 dB (A)
THD (1 kHz and nominal deviation)	< 1%
Frequency range	40 - 20,000 Hz
Squelch	1,5 µV
Dimension in mm	213 x 145 x 44
Weight	approx. 700 g
Plug-in mauns unit	120 / 230 / 240 V AC ± 10 %

3 ALLGEMEINES

3.1 INHALT DER SERVICE-ANLEITUNG

Auf geeigneten Meßplätzen kann die Reparatur der Leiterplatten bis auf Bauteilebene erfolgen. Detaillierte Reparaturanleitungen befinden sich in den Service-Hinweisen und der Prüf- und Abgleichanleitung.

Die Service-Anleitung vermittelt das entsprechende Wissen zur Fehlerlokalisation und Reparatur des EM 1031-U.

3.2 SERVICE-KONZEPT

3.2.1 Leiterplatte

Die Leiterplatte des EM 1031-U ist als 2-seitig kupferkaschierte Platine aufgebaut und kann durch einen unsachgemäßen Reparaturversuch irreparabel beschädigt werden.

3.2.2 Service-Anleitung

Die Service-Anleitung soll dem Techniker die Möglichkeit bieten, die wichtigsten Reparatur- und Abgleicharbeiten ausführen zu können.

Die Service-Anleitung kann im Bedarfsfall auch dem Kunden ausgehändigt werden.

3.2.3 SMD (Surface Mounted Devices)

Die Leiterplatten des EM 1031-U sind weitgehend mit Chip-Elementen (SMD) bestückt. Sollte beim Hantieren mit den Baugruppen ein SMD mechanisch zerstört werden, ist es erforderlich, dieses Bauelement zu ersetzen.

SMD werden direkt auf die dafür vorgesehenen Lötflächen gelötet. Hierfür besitzen sie lötfähige Stirnkontaktierungen, die weitgehend hitzeunempfindlich sind.

Zum Auswechseln ist folgendes Werkzeug erforderlich: Neben einer Pinzette und einem normalen temperaturgeregelten Lötkolben (z. B. Weller mit 0,8 mm Flachkopflötspitze PT-H 7 oder 0,8 mm Langkopflötspitze PT-K 7) sollten noch ein absolut rückschlagfreies Absauggerät und 1,2 mm Entlötlitze vorhanden sein. Sinnvoll ist eine Arbeitslupe.

Die Lötzeit ist so kurz wie möglich zu halten, damit die Leiterbahnen nicht beschädigt werden. Besonders beim Auslöten der Bauteile ist darauf zu achten, daß die Leiterbahnen nicht abgehoben werden. Danach ist die Auflagefläche der Bauteile von Lötresten zu säubern. Um mechanische Spannungen in den Bauteilen zu vermeiden, sollte man erst nach dem Erkalten der ersten Lötstelle die gegenüberliegende Seite anlöten.

Eine Wiederverwendung eines bereits ausgelöteten Chip-Bauelementes ist nicht zulässig. Dies gilt auch dann, wenn es offensichtlich fehlerfrei ist, da durch die mechanische Beanspruchung beim Ein- und Auslöten eine Beschädigung nicht ausgeschlossen werden kann.

Die SMD werden als Ersatzteile in Packeinheiten von je 50 Stück geliefert. Die Lagerbehälter müssen verwechslungssicher gekennzeichnet sein, da nur dadurch eine Unterscheidung der Bauteile möglich ist.

3 GENERAL

3.1 CONTENTS OF THIS SERVICE MANUAL

Special tools and test equipment allow the modules to be easily repaired up to the lowest level, i.e. their individual components. Detailed instructions are given in the service hints as well as in the test and alignment instructions.

The present service manual shall provide the service engineer with important information required to find faults and to repair the EM 1031-U.

3.2 SERVICING

3.2.1 Printed circuit board

The PCB incorporated into the EM 1031-U is a double-sided printed circuit board which can be accidentally damaged through improper handling or repair.

3.2.2 Service manuals

The present document shall help the service engineer to accomplish the most important maintenance and repair work.

The service manual may be handed to customers, if need be.

3.2.3 SMD (Surface Mounted Devices)

The PCBs incorporated into the EM 1031-U chiefly include Surface Mounted Devices (SMD). Should one SMD be accidentally damaged, replace the defective component with a new one.

SMDs are to be soldered to the surface provided for this purpose. They feature solderable contacts which are relatively insensitive to heat.

Tools required to replace SMDs: tweezers, temperature-controlled soldering iron (e.g. Weller with 0.8 mm flat headed soldering tip PT-H 7 or 0.8 mm oblong soldering tip PT-K 7), blow-back proof unsoldering set, 1.2 mm unsoldering wire. It is recommendable to use magnifying glasses.

Minimize the soldering time in order not to damage the PCB. Be careful not to damage any tracks when unsoldering the components to be replaced. Clean the surface. Wait until the first soldered joint has cooled down before starting to solder the opposite side. This serves to avoid stress built-up in the components.

Do not reuse unsoldered components, even if they seem to be faultless. Mechanical damage, possibly caused by soldering or unsoldering some components, cannot be excluded.

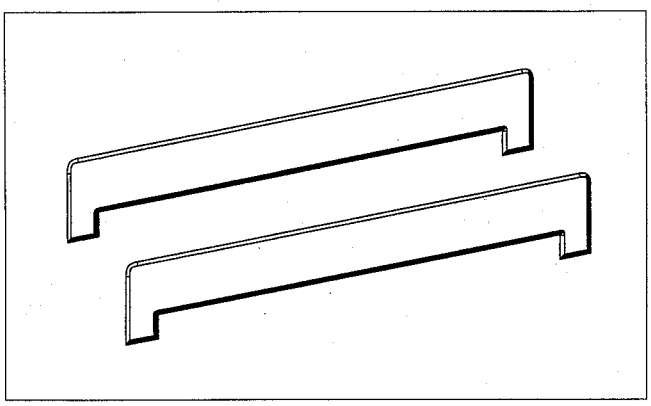
SMDs are available as spare parts, 50 pcs. packaged in a poly bag. Containers or packages should be marked in order to make the components distinguishable from each other.

4 MESSGERÄTE UND PRÜFMITTEL

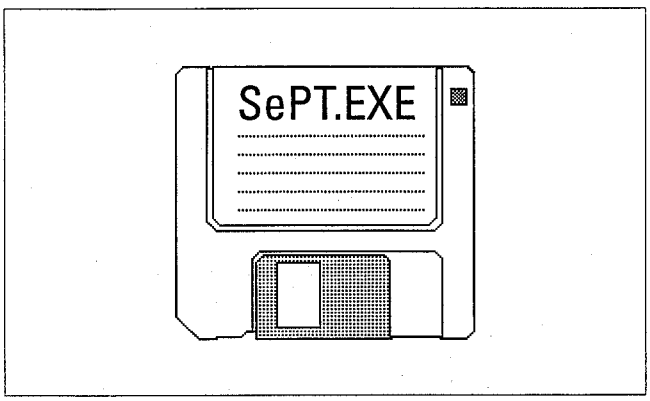
1 Spektrum - Analysator (z.B. Advantest R 4131 A)
1 Tracking - Generator (z.B. Advantest TR 4131 A)
1 HF - Signalgenerator (z.B. Rohde & Schwarz SMS 2)
1 Frequenzmeßgerät (z.B. HEB Digicount)
1 NF - Multimeter (z.B. Sennheiser UPM 550-1)
1 Oszilloskop (z.B. Hameg 605)
1 Voltmeter Ri ≥ 1 MΩ / V (z.B. Thandar TM 351)
1 Amperemeter (z.B. Thandar TM 351)
1 Netzgerät 0 - 20 V / 1 A
1 IBM-kompatibler PC (mit Windows ab V3.1)

4.1 SPEZIELLE SERVICE-HILFSMITTEL

Spezialwerkzeug zur Gehäusedemontage (Bestell-Nr. 70503)
Service-Adapter M-EM1046 PH (Bestell-Nr. 49922)
Service-Adapter M-SePT1 PH (Bestell-Nr. 70501)
Programmier-Software SePT.EXE (Bestell-Nr. 70502)
Programmierbuchse J5 (Bestell-Nr. 45263)



Spezialwerkzeug zur Gehäusedemontage (Bestell-Nr. 70503)
Tool for disassembling the housing (spare part no. 70503)



Programmier-Software SePT.EXE (Bestell-Nr. 70502)
SePT.EXE programming tool (spare part no. 70502)

4.2 SERVICE-SET SePT1

Sämtliche neuen Service-Hilfsmittel sind auch komplett als Service-Set SePT1 (Bestell-Nr. 70497) erhältlich. Das Set besteht aus:

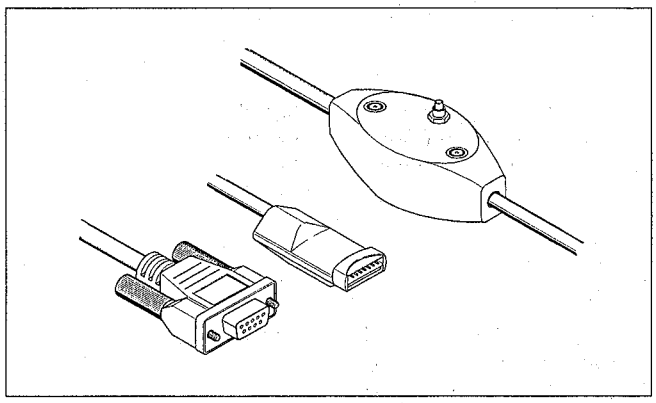
- 1 x Service-Adapter M-SePT1 PH
- 1 x Programmier-Software SePT.EXE
- 10 x Programmierbuchse J5
- 1 x Software-Registrationskarte
- 1 x Installationshinweise

4 MEASURING AND TEST EQUIPMENT

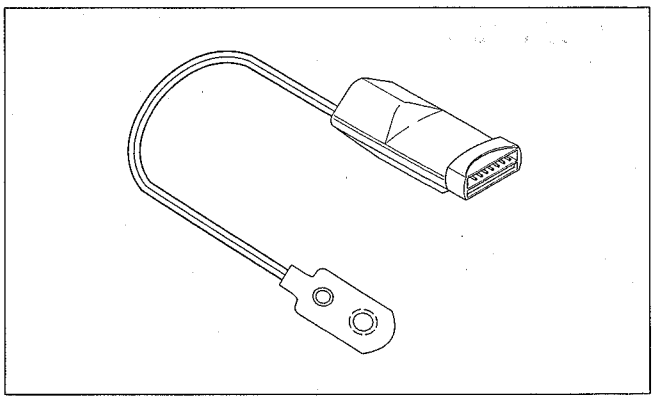
1 Spectrum analyser (e.g. Advantest R 4131 A)
1 Tracking generator (e.g. Advantest TR 4131 A)
1 RF signal generator (e.g. Rohde & Schwarz SMS 2)
1 Frequency meter (e.g. HEB Digicount)
1 AF multimeter (e.g. Sennheiser UPM 550-1)
1 Oscilloscope (e.g. Hameg 605)
1 Voltmeter Ri ≥ 1 MΩ / V (e.g. Thandar TM 351)
1 Ammeter (e.g. Thandar TM 351)
1 Power supply unit 0 - 20 V / 1A
1 IBM compatible PC (with Windows, version 3.1 or later)

4.1 SPECIAL SERVICE TOOLS

Tool for disassembling the housing (spare part no. 70503)
M-EM 1046 PH service adaptor (spare part no. 49922)
M-SePT1 PH service adaptor (spare part no. 70501)
SePT.EXE programming tool (spare part no. 70502)
J5 programming connector (spare part no. 45263)



Service-Adapter M-EM1046 PH (Bestell-Nr. 49922)
M-EM 1046 PH service adaptor (spare part no. 49922)



Service-Adapter M-SePT1 PH (Bestell-Nr. 70501)
M-SePT1 PH service adaptor (spare part no. 70501)

4.2 SePT1 SERVICE SET

All new service tools are available as a complete set (spare part no. 70497). This set contains:

- 1 x M-SePT1 PH service adaptor
- 1 x SePT.EXE programming tool
- 10 x J 5 programming connector
- 1 x software registration card
- 1 x installation instructions

5 SERVICE HINWEISE

5.1 ALLGEMEINES ÜBERPRÜFEN

Zur Eingrenzung von Fehlern empfielt es sich den Empfänger EM 1031-U mit einem funktionsfähigen Sender (z.B. BF 1081-U oder SKM 1072-U) zu überprüfen. Hierzu wird der Handsender wie in der Praxis betrieben. Der Empfänger EM 1031-U wird betriebsbereit gemacht (Steckernetzteil einstecken, Empfänger einschalten, Kanalwahlschalter einstellen, Verstärker am Ausgang anschließen und Signal abhören). Im Praxistest (Betrieb ohne Antenne) wird der Empfänger nun auf folgende Merkmale überprüft:

1. Klang (Modulation, Verzerrungen)
2. Rauschen (Empfindlichkeit, Reichweite ca. 20 m)
3. Diversityverhalten (Sender im Abstand von ca. 3 Metern zwischen Antenneneingängen bewegen)
4. Funktion der Bedienelemente (Volume, Channel)
5. Wackelkontakte (Abklopfen)

5.2 EMPFANGSEIGENSCHAFTEN ÜBERPRÜFEN

Bei Empfängern die vermutlich eine unzureichende Empfindlichkeit haben (mangelnde Reichweite) ist dieses mit Hilfe eines HF-Signalgenerators zu überprüfen. Hierzu ist der HF-Signalgenerator (HF-Trägerfrequenz auf Kanal 8, HF-Ausgangsspannung 1 mV, Frequenzhub 40 kHz, Modulation 1 kHz) an Antenneneingang A oder B anzuschließen. Der Empfänger EM 1031-U wird nun betriebsbereit gemacht (Steckernetzteil einstecken, Empfänger einschalten, Kanalwahlschalter einstellen (Kanal 8), Verstärker am Ausgang anschließen und Signal abhören). Das Testsignal ist jetzt hörbar. Nun wird die HF-Ausgangsspannung des HF-Signalgenerators bis auf ca. 5 µV verkleinert. Ist das Testsignal nun immer noch zu hören, ist die Empfindlichkeit des Empfängers EM 1031-U ausreichend. Wird die HF-Ausgangsspannung weiterhin vermindert, schaltet der Empfänger bei ca. 1,5 µV stumm (Rauschsperre).

5 SERVICE INSTRUCTIONS

5.1 GENERAL TEST

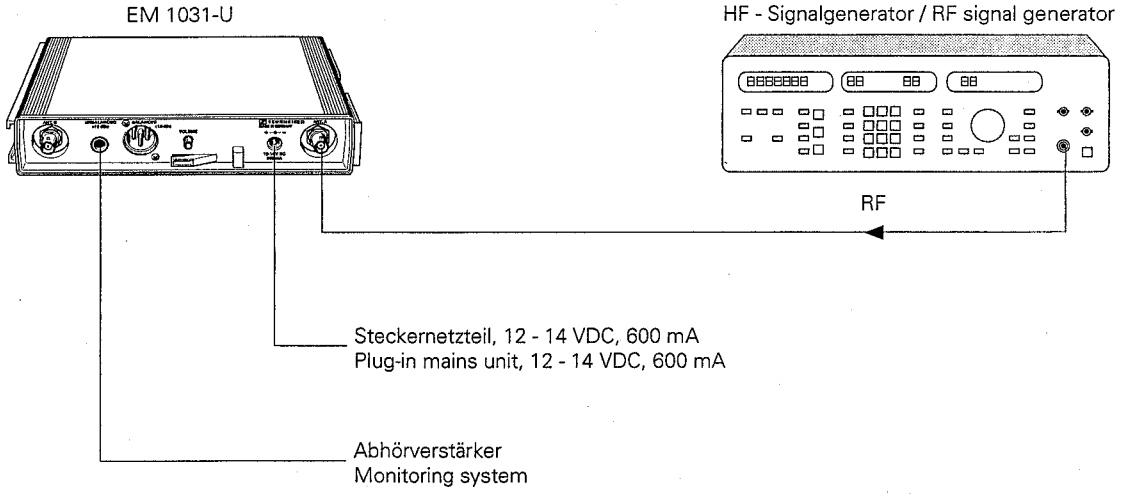
Test the EM 1031-U receiver with an operational transmitter (e.g. BF 1081-U or SKM 1072-U) to narrow down the possible causes of a fault. Operate the transmitter as usually. Put the EM 1031-U receiver into operation (connect the plug-in mains unit, switch the receiver on, select a channel, connect a monitoring amplifier at the receiver output and listen to the signal). The receiver is operated without antenna. Now check the following:

1. Sound quality (modulation, distortions)
2. Noise (sensitivity, range approx. 20 m)
3. Diversity operation (move the transmitter between the antenna inputs at a distance of approx. 3 m)
4. Functioning of the operating elements (volume control, channel selector switch)
5. Loose contacts (by knocking at the housing)

5.2 RECEPTION TEST

If the sensitivity of the receiver is probably too low (range is reduced) test the sensitivity with an RF signal generator. Connect the RF signal generator to antenna input A or B (channel 8 carrier frequency, RF output voltage 1 mV, deviation 40 kHz, modulation 1 kHz). Put the EM 1031-U receiver into operation (i.e. connect the plug-in mains unit, switch the receiver on, select channel 8, connect a monitoring amplifier at the receiver output). You can hear the test signal. Reduce the RF output voltage to approx. 5 µV. If you can still hear the test signal, the receiver's sensitivity is sufficient. If you reduce the output voltage still further, the receiver will switch to mute at approx. 1.5 µV (squelch).

MESSAUFBAU / **TEST SET-UP**


EM 1031-U
HF - Signalgenerator / RF signal generator
RF
Steckernetzteil, 12 - 14 VDC, 600 mA
Plug-in mains unit, 12 - 14 VDC, 600 mA
Abhörverstärker
Monitoring system

HF-Trägerfrequenz Kanal 8,
HF-Ausgangsspannung 1 mV,
Frequenzhub 40 kHz,
Modulation 1kHz

RF carrier frequency channel 8,
RF output voltage 1 mV,
Deviation 40 kHz,
Modulation 1kHz

5.3 ABGLEICH UND FEHLERSUCHE

Zum Abgleich und zur Reparatur ist der Empfänger EM 1031-U zu demontieren.

1. Gehäuse öffnen; dazu mit Spezialwerkzeug (Bestell-Nr. 70503) Chassis entriegeln und nach hinten aus dem Gehäuse ziehen.
2. Schrauben des Abschirmdeckels lösen und entfernen.
3. Abschirmdeckel von dem Abschirmprofil entnehmen.
4. Bei Neuabgleich sind die sechs Widerstandstrimmer in Mittelstellung zu bringen.

Max. Links | Mittelstellung | Max. Rechts | toter Bereich

Achtung: Die Widerstandstrimmer haben keinen Anschlag. Beim Abgleich ist darauf zu achten, daß Einstellungen nicht am Rande oder sogar im "toten Bereich" vorgenommen werden.

5. Empfänger betriebsbereit machen; dazu Steckernetzteil oder Netzgerät (12 VDC, Strombegrenzung 600 mA) an Stromversorgungsbuchse J2 anschließen.
6. Empfänger mit Betriebsschalter S2 einschalten.
7. Kanalwahlschalter S1 auf Kanal in der Mitte Schaltbandbreite schalten (in der Regel Kanal 8).
8. HF-Signalgenerator wie in der Prüf- und Abgleichanweisung beschrieben an Antenneneingang B anschließen.

   Grundeinstellungen des HF-Signalgenerators:
   HF-Trägerfrequenz: wie 7.,
   HF-Ausgangsspannung: 1 mV,
   Frequenzhub: 40 kHz,
   Modulation: 1kHz.
9. NF-Ausgang J4 über hochohmigen Trennübertrager (erdfrei symmetrisch) mit NF-Meßgerät und Oszilloskop verbinden (XLR-Buchse J4, Pin2 nach Pin3). Ist kein Trennübertrager vorhanden, kann die halbe Ausgangspannung unsymmetrisch (XLR-Buchse J4, Pin2 nach Pin1, oder Pin3 nach Pin1) gemessen werden.
10. Prüf- und Abgleichanweisung durchführen. Bei stark abweichenden Meßwerten kann die Leiterplatte unter Zuhilfenahme des Stromlaufplanes repariert werden.

6 FREQUENZÄNDERUNGEN

6.1 PROGRAMMIERUNG

1. Gehäuse öffnen; dazu mit Spezialwerkzeug (Bestell-Nr. 70503) Chassis entriegeln und nach hinten aus dem Gehäuse ziehen.
2. Auf der Empfänger-Leiterplatte ist Programmierbuchse J5 (Bestell-Nr. 45263) zu bestücken.
3. Empfänger betriebsbereit machen; dazu Steckernetzteil oder Netzgerät (12 VDC, Strombegrenzung 600 mA) an Stromversorgungsbuchse J2 anschließen.
4. Service-Adapter M-EM 1046 PH (Bestell-Nr. 49922) am freien COM-Port des IBM-kompatiblen PC's kontaktieren.
5. Service-Adapter M-SePT1 PH (Bestell-Nr. 70501) am offenen Ende des Service-Adapters M-EM 1046 PH kontaktieren.
6. Service-Adapter M-SePT1 PH auf Programmierbuchse J5 der Empfänger-Leiterplatte stecken.

5.3 ALIGNMENT AND TROUBLESHOOTING

For alignment or repairs the EM 1031-U receiver has to be disassembled.

1. For opening the housing, use the special tool (spare part no. 70503) to unlatch the chassis and pull it out of the housing.
2. Remove the screws from the lid of the RF screen.
3. Remove the lid.
4. If the receiver has to be re-aligned, set the six trimming resistors to centre position.

left max. | centre position | right max. | dead band

N.B.: The trimming resistors do not have an end stop. When aligning, make sure that they are not near or in the dead band.

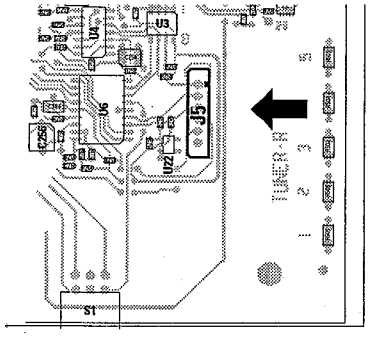
5. To put the receiver into operation, connect the plug-in mains unit or the power supply unit (12 V DC, current limited to 600 mA) to the J2 mains socket.
6. Switch the receiver on with S2 (on/off switch).
7. With switch S1, select the channel at the middle of the receiver's switching bandwidth (usually channel 8).
8. Connect the RF signal generator to antenna socket B as described in the test and alignment instructions.

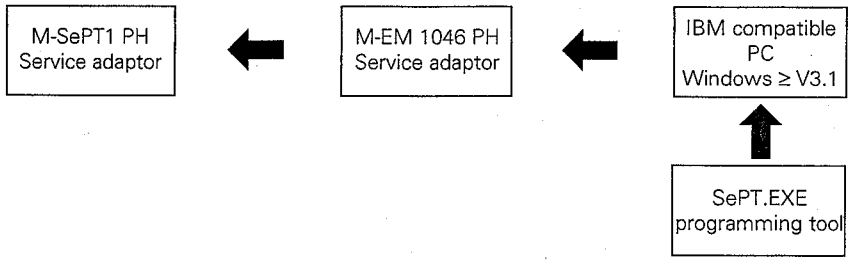
   Adjustments on the RF signal generator:
   RF carrier frequency as in 7.,
   RF output voltage 1 mV,
   deviation 40 kHz,
   modulation 1 kHz.
9. Connect the AF output J4 via a high-resistance isolating transformer (floating, balanced) to an AF measuring device and an oscilloscope (XLR socket J4, pin2 to pin3). If you do not have an isolating transformer, you can measure half the output voltage unbalanced (XLR socket J4, pin2 to pin1 or pin3 to pin1).
10. Carry out test and alignment instructions. If the measured values deviate strongly from the required values, the PCB should be repaired using the circuit diagram.

6 CHANGING THE FREQUENCIES

6.1 PROGRAMMING

1. For opening the housing, use the special tool (spare part no. 70503) to unlatch the chassis and pull it out of the housing.
2. Mount the J5 programming connector (spare part no. 45263) onto the receiver PCB.
3. To put the receiver into operation, connect the plug-in mains unit or the power supply unit (12 V DC, current limited to 600 mA) to the J2 mains socket.
4. Connect the M-EM 1046 PH service adaptor (spare part no. 49922) to the unused COM port of the IBM compatible PC.
5. Connect the M-SePT1 PH service adaptor (spare part no. 70501) to the other end of the M-EM 1046 PH service adaptor.
6. Connect the M-SEPT1 PH service adaptor to the J5 programming connector on the receiver PCB.





7. Empfänger mit Betriebsschalter S2 einschalten.
8. Programm SePT.EXE unter Windows starten.
9. Die Daten des EEPROM's werden ausgelesen und im Programmfenster angezeigt.
10. Die neuen Kanalfrequenzen können nun eingegeben werden. Das Programm SePT.EXE unterstützt die Online-Hilfe. Mit der "Help"-Funktion können somit Informationen über die Bedienung der Programm-Software abgerufen werden.
11. Nach dem Programmiervorgang fragt das Programm SePT.EXE automatisch den Inhalt des EEPROM's ab.
12. Nach dem Überprüfen des gespeicherten Inhaltes kann der Service-Adapter M-SePT1 PH von der Programmierbuchse J5 entfernt werden.
13. Befinden sich die programmierten Frequenzen *innerhalb der bisherigen Schaltbandbreite*, sind lediglich die Empfangsfrequenzen und Spezifikationen des Empfängers zu überprüfen.

    Befinden sich die programmierten Frequenzen *außerhalb der Schaltbandbreite*, aber innerhalb der Grenzen des bestückten HF-Teils (RF-Amplifier, VCO, Buffer, µC-Range), ist ein Neuabgleich laut Prüf- und Abgleichanweisung erforderlich.

    Befinden sich die programmierten Frequenzen *außerhalb der Grenzen des bestückten HF-Teils* (RF-Amplifier, VCO, Buffer, µC-Range), sind die entsprechenden Bauteilvariablen zu ersetzen. Anschließend ist ein Neuabgleich laut Prüf- und Abgleichanweisung erforderlich.
14. Nach der Modifikation des Empfängers wird der Deckel des Abschirmgehäuses verschraubt und das Empfängerchassis in das Gehäuse geschoben und verriegelt. Dabei ist auf den ordnungsgemäßen Sitz der Knöpfe von S1 und S2 zu achten.
15. Nach der Endmontage ist der Empfänger mit einem entsprechenden Sender zu überprüfen.

6.2 FUNKTIONSÜBERPRÜFUNG

Empfänger EM 1031-U montieren. Funktionsüberprüfung des Empfängers mit einem funktionsfähigen Sender (z.B. BF 1081-U oder SKM 1072-U). Hierzu wird der Handsender wie in der Praxis betrieben. Der Empfänger EM 1031-U wird betriebsbereit gemacht (Steckernetzteil und Antennen einstecken, Empfänger einschalten, Kanalwahlschalter einstellen, Verstärker am Ausgang anschließen und Signal abhören). Im Praxistest wird der Empfänger nun auf folgende Merkmale überprüft:

1. Klang (Modulation, Verzerrungen)
2. Rauschen (Empfindlichkeit, Reichweite ca. 20 m)
3. Diversityverhalten (Sender im Abstand von ca. 3 Metern zwischen Antenneneingängen bewegen)
4. Funktion der Bedienelemente (Volume, Channel)
5. Wackelkontakte (Abklopfen)

7. Switch the receiver on with S2.
8. Start SePT-EXE under Windows.
9. SePT-EXE reads in and displays the receiver's EEPROM data.
10. You can now enter new channel frequencies. SePT.EXE has online help. For information on how to use the software simply choose the "Help" command.
11. After programming, SePT.EXE automatically displays the EEPROM data so that you can check whether they are correct.
12. Remove the M-SePT1 PH service adaptor from the J5 programming connector.
13. If the programmed frequencies are *within the previous switching bandwidth*, you only have to check receiving frequencies and receiver data.

    If the programmed frequencies lie *outside the switching bandwidth* but are within the possible bandwidth determined by the components of the RF section (RF amplifier, VCO, buffer, microcontroller), you have to re-align the receiver according to the test and alignment instructions.

    If the programmed frequencies are *outside the total bandwidth determined by the components of the RF section* (RF amplifier, VCO, buffer, microcontroller), you have to replace the components in question. Then align the receiver according to the test and alignment instructions.
14. When you have changed the receiving frequencies, screw the lid of the RF screen back on. Insert the chassis into the housing and latch. Make sure that S1 and S2 are in correct position.
15. Check the receiver with a suitable transmitter.

6.2 FUNCTIONAL TEST

Reassemble the EM 1031-U receiver. Test it with a suitable transmitter (e.g. BF 1081-U or SKM 1072-U). Operate the transmitter as usually. Put the EM 1031-U receiver into operation (connect the plug-in mains unit, insert the antennae, switch the receiver on, select a channel, connect a monitoring amplifier at the receiver output and listen to the signal). Now check the following:

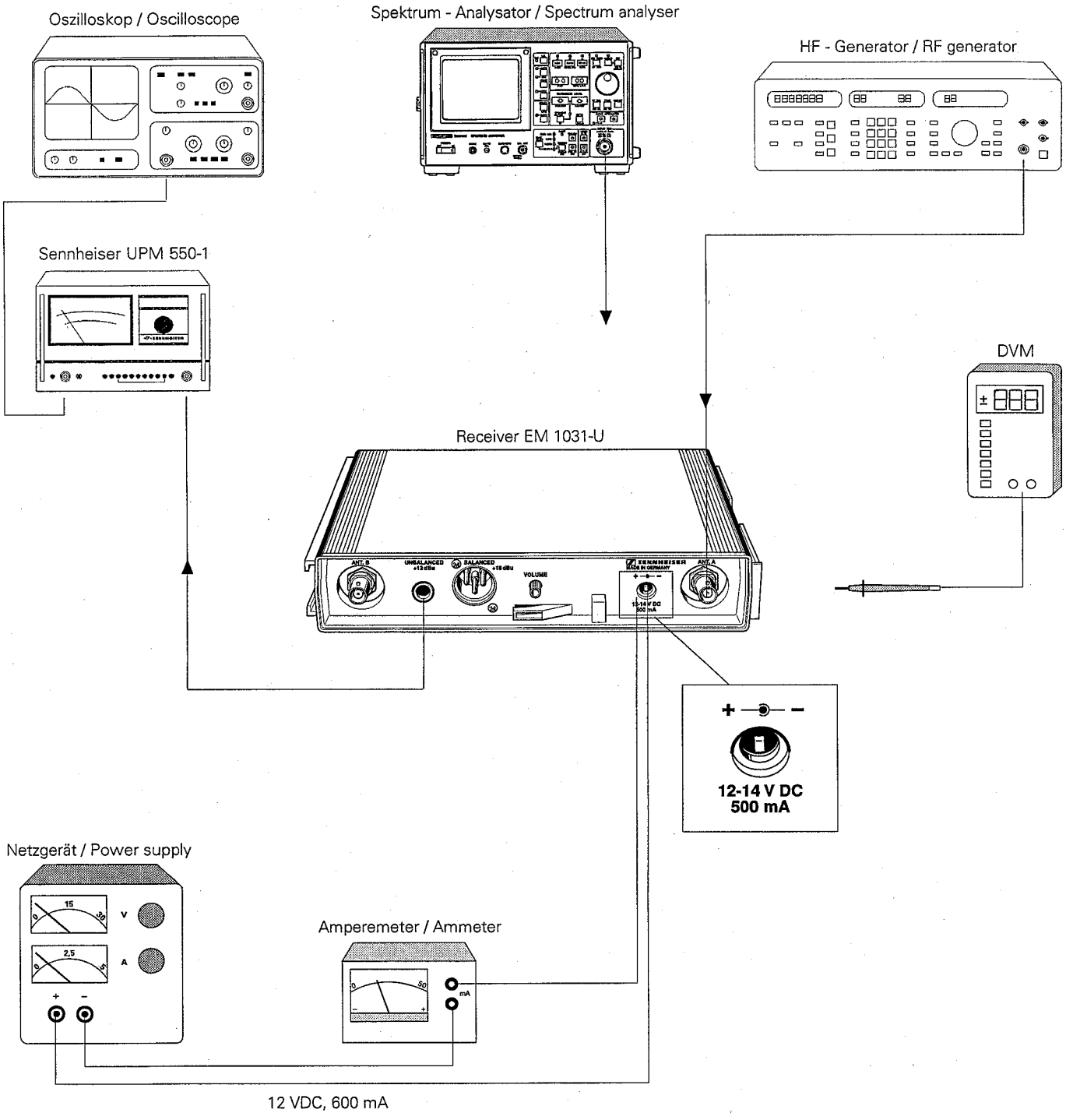
1. Sound quality (modulation, distortions)
2. Noise (sensitivity, range approx. 20 m)
3. Diversity operation (move the transmitter between the antenna inputs at a distance of approx. 3 m)
4. Functioning of the operating elements (volume control, channel selector switch)
5. Loose contacts (by knocking at the housing)

7 PRÜF- UND ABGLEICHANWEISUNG

7.1 MESSAUFBAU

7 TEST AND ALIGNMENT INSTRUCTIONS

7.1 TEST SET-UP

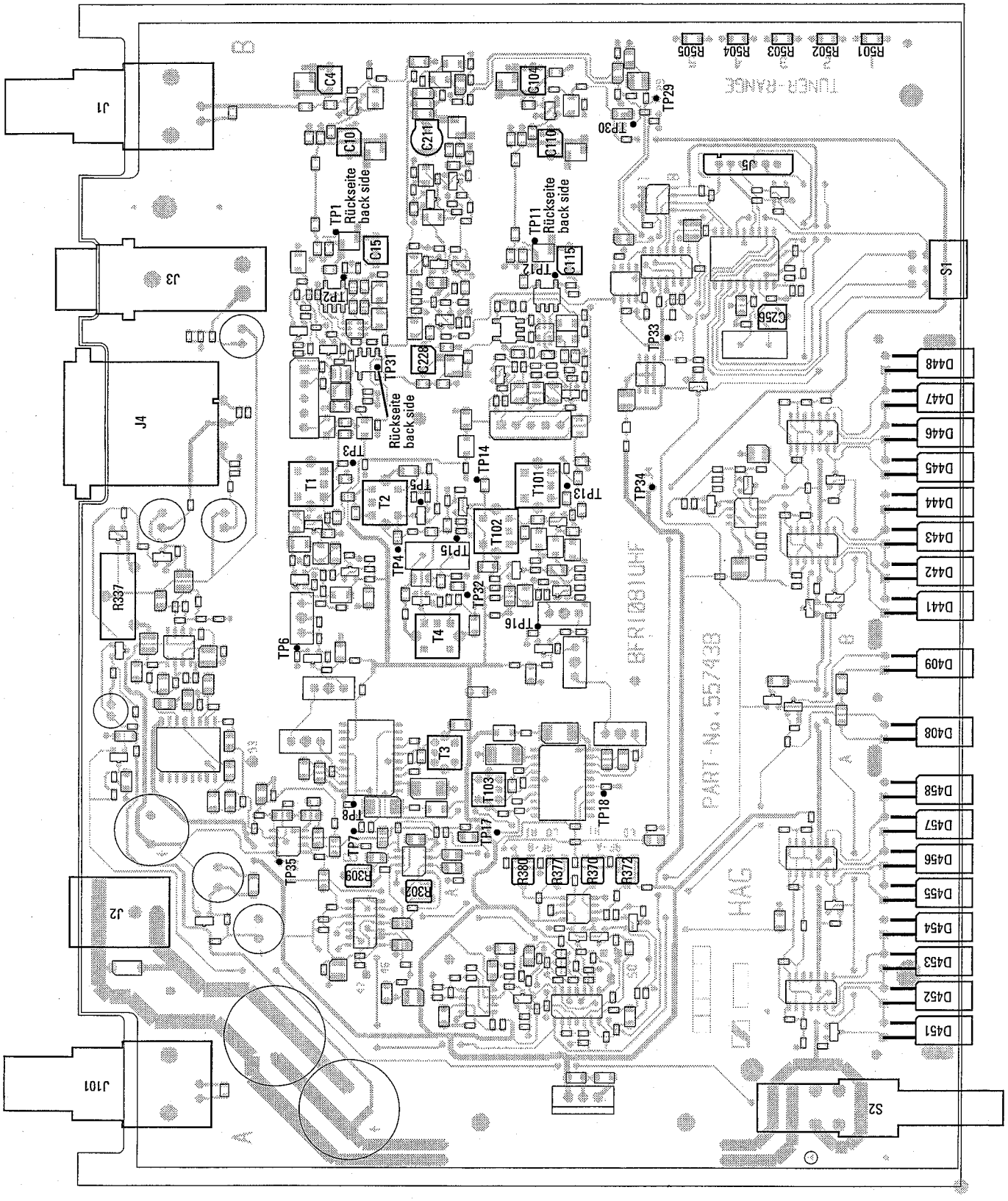


NOTIZEN:

NOTES:

7.2 ABGLEICHELEMENTE, MESSPUNKTE

7.2 ADJUSTER LOCATION, TEST POINTS



NOTIZEN:

NOTES:

7.3 PRÜF - UND ABGLEICHANWEISUNG

Nr.	Messung, Einstellung	Signal-einspeisung	Vorbereitung, Geräteeinstellung	Meßpunkt	Sollwert	Einsteller	Bemerkungen
1	Stromaufnahme	-	UB: 12 VDC, S2 "ON", Amperemeter	J2	ca. 400 mA		
1.1	Betriebsspannung (+ 11 VDC)	-	DC - Voltmeter	TP35	+ 11 VDC		
1.2	Betriebsspannung (+ 8 VDC)	-	DC - Voltmeter	TP34	+ 8 VDC		
1.3	Betriebsspannung (+ 5 VDC)	-	DC - Voltmeter	TP33	+ 5 VDC		
1.4	Betriebsspannung (- 4 VDC)	-	DC - Voltmeter	TP29	- 4 VDC		
2	Bereichsgrenzen der Tuning-spannung	-	S1 auf unterste und oberste Empfangs-frequenz schalten; DC - Voltmeter	TP30	- 2,0 ...+ 3,8 VDC	C211	Regelsteilheit ca. 5 - 11 MHz / V
3	1. Oszilator (Pegel)	-	S1 auf mittlere Frequenz des Empfangsbereiches einstellen; Spektrum - Analysator	TP31	max. Pegel, ca. - 33 ... - 21 dBm	C228	
3.1	1. Oszillator (Frequenz)	-	wie 3; Frequenzmeßgerät	TP31	Empfangs-frequenz - ZF (65,75 MHz), Tol. ± 200 Hz	C256	
3.2	2. Oszillator (Frequenz)	-	Spektrum - Analysator; CF: 76,45 MHz, SPAN: 10 kHz, RBW: 1 kHz	TP3 oder TP13	76,45 MHz, Tol. ± 3 kHz	T4	Kern von T4 ein-drehen, bis Frequenz-sprung zu sehen ist. Kern langsam heraus-drehen, bis Frequenz auf Sollfrequenz springt. Anschließend Kern noch 1/2 Drehung weiter herausdrehen. Abgleich durch Aus- und Einschalten überprüfen. Eventuell Abgleich wiederholen
3.3	2. Oszillator-Buffer (Pegel Kanal B)	-	Spektrum - Analysator	TP3	76,45 MHz: max. Pegel, ca. - 34 ...- 26 dBm; 65,75 MHz: ca. - 32 ...- 24 dBm;	T2 -	
3.4	2. Oszillator-Buffer (Pegel Kanal A)	-	Spektrum - Analysator	TP13	76,45 MHz: max. Pegel, ca. - 34 ...- 26 dBm; 65,75 MHz: ca. - 32 ...- 24 dBm;	T102 -	
4	HF - Eingang Kanal B	Tracking-Generator - 20 dBm an J1	Spektrum - Analysator	TP1 auf Lötseite	B: 27 MHz, ca. - 40...- 25 dBm	C4, C10, C15	
4.1	HF - Eingang Kanal A	Tracking-Generator - 20 dBm an J101	Spektrum - Analysator	TP11 auf Lötseite	B: 27 MHz, ca. - 40...- 25 dBm	C104, C110, C115	
5	Demodulator Kanal B	HF-Signalgenerator an J1: Empfangsfrequenz, HF: 1 mV, Hub: 40 kHz, Mod: 1 kHz	NF - Voltmeter, Oszilloskop	J4	max. Pegel	T3	
5.1	NF - Verstärker Kanal B	wie 5	NF - Voltmeter, Oszilloskop	J4	2,9 Veff.	R309	
5.2	Demodulator Kanal B (Feinabgleich)	wie 5.1	Klirrfaktormeßgerät	J4	k < 0,4 %	T3	Eventuell 5.1 wiederholen

5.3	Empfindlichkeit Kanal B	HF-Signalgenerator an J1: Empfangsfrequenz, HF: 1 mV ... 3 µV, Hub: Aus	NF - Voltmeter (A-bewertet, effektiv), Oszilloskop	J4	min. Rauschen, - 74 ... - 82 dBu bei 3 µV	C4, C10, C15, T1	HF Eingangsspannung verringern und Abgleich auf Rauschminimum optimieren
5.4	Demodulator Kanal A	HF-Signalgenerator an J101: Empfangsfrequenz, HF: 1 mV, Hub: 40 kHz, Mod: 1 kHz	NF - Voltmeter, Oszilloskop	J4	max. Pegel	T103	
5.5	NF - Verstärker Kanal A	wie 5.4	NF - Voltmeter, Oszilloskop	J4	2,9 Veff.	R302	
5.6	Demodulator Kanal A (Feinabgleich)	wie 5.5	Klirrfaktormeßgerät	J4	k < 0,4 %	T103	Eventuell 5.5 wiederholen
5.7	Empfindlichkeit Kanal A	HF-Signalgenerator an J101: Empfangsfrequenz, HF: 1 mV ... 3 µV, Hub: Aus	NF - Voltmeter (A-bewertet, effektiv), Oszilloskop	J4	min. Rauschen, - 74 ... - 82 dBu bei 3 µV	C104, C110, C115, T101	HF Eingangsspannung verringern und Abgleich optimieren
6	Feldstärkeanzeige Kanal A (10 dBµV)	HF-Signalgenerator an J101: Empfangsfrequenz, HF: 3 µV, Hub: 40 kHz, Mod: 1 kHz	Trimmer R380 auf min. drehen	LED Anzeige RF - LEVEL	1. LED leuchtet (D452)	R372	
6.1	Feldstärkeanzeige Kanal A (40 dBµV)	HF: 100 µV, sonst wie 6	-	LED Anzeige RF - LEVEL	7. LED leuchtet (D458)	R370	Abgleich 6 und 6.1 wechselseitig wiederholen, bis LED Anzeige richtig anzeigt
6.2	Feldstärkeanzeige Kanal B (10 dBµV)	HF-Signalgenerator an J1: Empfangsfrequenz, HF: 3 µV, Hub: 40 kHz, Mod: 1 kHz	-	LED Anzeige RF - LEVEL	1. LED leuchtet (D452)	R377	
6.3	Feldstärkeanzeige Kanal B (40 dBµV)	HF: 100 µV, sonst wie 6.2	-	LED Anzeige RF - LEVEL	7. LED leuchtet (D458)	R380	Abgleich 6.2 und 6.3 wechselseitig wiederholen, bis LED Anzeige richtig anzeigt
7	Überprüfung der Empfindlichkeit Kanal B	HF-Signalgenerator an J1: Empfangsfrequenz, HF: 3 µV, Hub: Aus	NF - Voltmeter (A-bewertet, effektiv), Oszilloskop	J4	min. Rauschen < - 74 dBu		
7.1	Überprüfung der Empfindlichkeit an den Frequenzgrenzen Kanal B	wie 7	S1 auf unterste und oberste Empfangsfrequenz schalten; NF - Voltmeter (A-bewertet, effektiv), Oszilloskop	J4	min. Rauschen < - 68 dBu	evtl. mit C4, C10, und C15 optimieren	
7.2	Überprüfung der Empfindlichkeit Kanal A	HF-Signalgenerator an J101: Empfangsfrequenz, HF: 3 µV, Hub: Aus	NF - Voltmeter (A-bewertet, effektiv), Oszilloskop	J4	min. Rauschen < - 74 dBu		
7.3	Überprüfung der Empfindlichkeit an den Frequenzgrenzen Kanal A	wie 7.2	S1 auf unterste und oberste Empfangsfrequenz schalten; NF - Voltmeter (A-bewertet, effektiv), Oszilloskop	J4	min. Rauschen < - 68 dBu	evtl. mit C104, C110, und C115 optimieren	
7.4	Max. Rauschabstand Kanal A	HF: 1 mV, sonst wie 7.3	S1 auf mittlere Frequenz des Empfangsbereiches einstellen; NF - Voltmeter (Fremdspannung)	J4	ca. - 97 dBu		

7.5	Max. Rausch-abstand Kanal B	HF-Signalgenerator an J1: sonst wie 7.4	wie 7.4	J4	ca. - 97 dBu		
8	NF - Frequenzgang Kanal B	HF: 1 mV, Hub: 40 kHz, Mod: 1 kHz, sonst wie 7.5	wie 7.5	J4	11,4 dBu (0 dB)		
8.1	NF - Frequenzgang Kanal B	Mod: 30 Hz, sonst wie 8	wie 8	J4	2,9 ... 4,9 dBu (- 6,5 ...- 8,5 dB)		
8.2	NF - Frequenzgang Kanal B	Mod: 10 kHz, sonst wie 8.1	wie 8.1	J4	- 6,1...- 8,1 dBu (- 17,5...- 19,5 dB)		
8.3	NF - Frequenzgang Kanal A	HF-Signalgenerator an J101: HF: 1 mV, Hub: 40 kHz, Mod: 1 kHz, sonst wie 8.2	wie 8.2	J4	11,4 dBu (0 dB)		
8.4	NF - Frequenzgang Kanal A	Mod: 30 Hz; sonst wie 8.3	wie 8.3	J4	2,9 ... 4,9 dBu (- 6,5 ...- 8,5 dB)		
8.5	NF - Frequenzgang Kanal A	Mod: 10 kHz; sonst wie 8.4	wie 8.4	J4	- 6,1 ...- 8,1 dBu (- 17,5 ...- 19,5 dB)		
8.6	Klirrfaktor Kanal A	Hub: 56 kHz, Mod: 1 kHz; sonst wie 8.5	Klirrfaktormeßgerät	J4	k < 0,5 %	evtl. mit T103 optimieren	Ab ca. 51 kHz Hub leuchtet die LED "+ 12 dB" der AF - LEVEL Anzeige
8.7	Klirrfaktor Kanal B	HF-Signalgenerator an J1: sonst wie 8.6	Klirrfaktormeßgerät	J4	k < 0,5 %	evtl. mit T3 optimieren	Ab ca. 51 kHz Hub leuchtet die LED "+ 12 dB" der AF - LEVEL Anzeige
9	Pegelgesteuerte Rauschsperre Kanal B	HF: ca. 1,5 µV; sonst wie 8.7	NF - Voltmeter	J4	Ausgang schaltet stumm		
9.1	Pegelgesteuerte Rauschsperre Kanal A	HF-Signalgenerator an J1: HF: ca. 1,5 µV; sonst wie 9	NF - Voltmeter	J4	Ausgang schaltet stumm		
9.2	Rauschgesteuerte Rauschsperre Kanal A	HF: 1 mV; Hub: ca. 60 kHz, Mod: 50 kHz; sonst wie 9.1	NF - Voltmeter	J4	Ausgang schaltet stumm		

NOTIZEN:

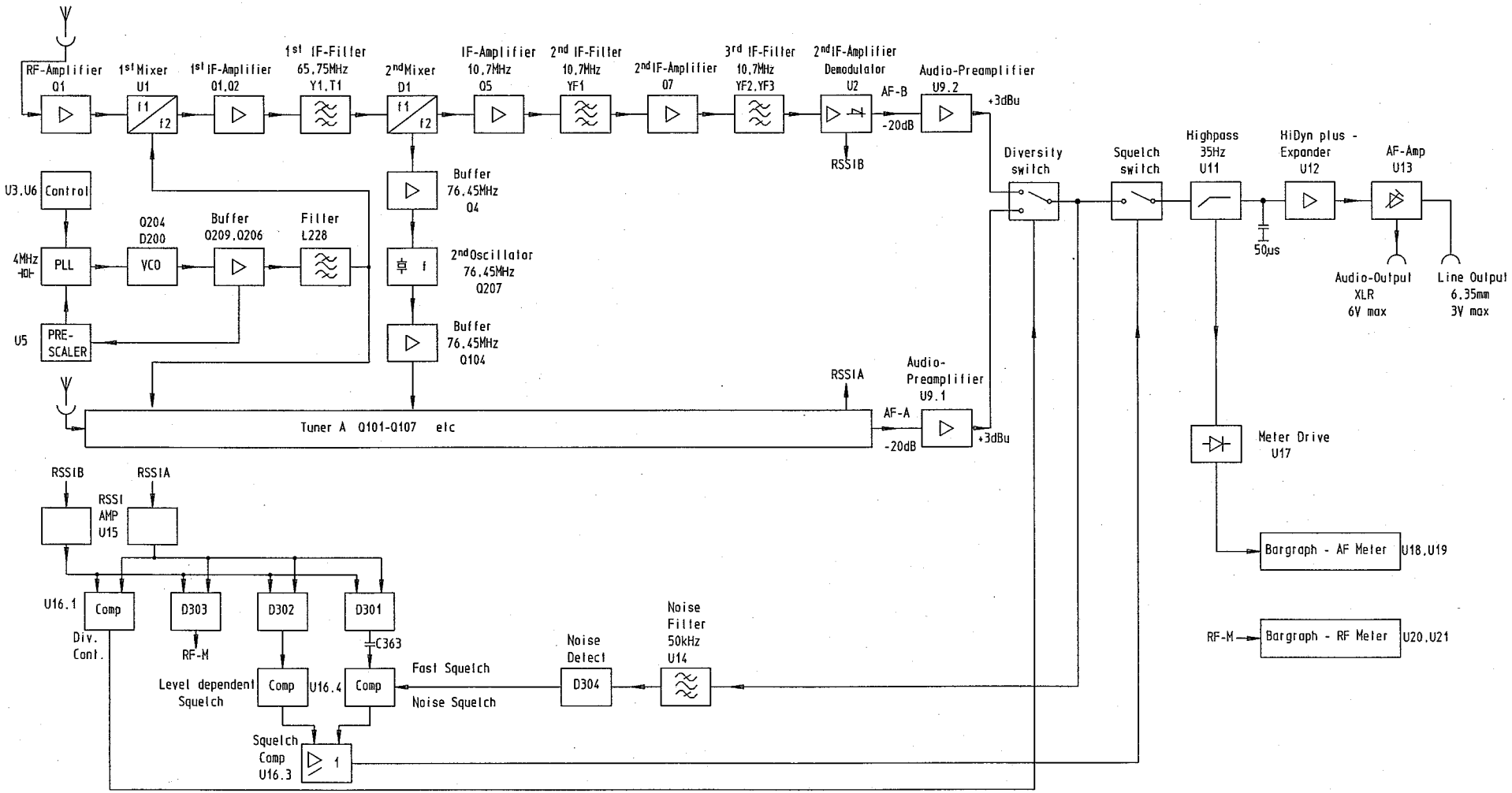
7.3 TEST AND ALIGNMENT INSTRUCTIONS

No.	Measurement, adjustment	Signal input	Preparations, settings	Test point	Required value	Adjust with	Remarks
1	Power consumption	-	V_B: 12 VDC, S2 "ON", Ammeter	J2	approx. 400 mA		
1.1	Operating voltage (+ 11 VDC)	-	DC voltmeter	TP35	+ 11 VDC		
1.2	Operating voltage (+ 8 VDC)	-	DC voltmeter	TP34	+ 8 VDC		
1.3	Operating voltage (+ 5 VDC)	-	DC voltmeter	TP33	+ 5 VDC		
1.4	Operating voltage (- 4 VDC)	-	DC voltmeter	TP29	- 4 VDC		
2	Limits of tuning voltage	-	Set S1 to lowest and highest receiving frequency; DC voltmeter	TP30	- 2.0 ...+ 3.8 VDC	C211	Rate of frequency rise approx. 5 - 11 MHz / V
3	1st oscillator (RF level)	-	Set S1 to medium receiving frequency of switching bandwidth; spectrum analyser	TP31	max. RF level, approx. - 33...- 21 dBm	C228	
3.1	1st oscillator (frequency)	-	as 3; frequency meter	TP31	Receiver frequency - IF (65.75 MHz), tol. ± 200 Hz	C256	
3.2	2nd oscillator (frequency)	-	Spectrum analyser CF: 76.45 MHz, SPAN: 10 kHz, RBW: 1 kHz	TP3 or TP13	76.45 MHz, tol. ± 3 kHz	T4	Turn the core of T4 in until a frequency peak occurs. Now slowly move the core out until the frequency reaches the required value. Then make another 1/2 turn. Turn the receiver off and on again and check the adjustment. If necessary, repeat the alignment.
3.3	Buffer of 2nd oscillator (level, channel B)	-	Spectrum analyser	TP3	76.45 MHz: max. level, approx. - 34 ...- 26 dBm; 65.75 MHz: approx. - 32 ...- 24 dBm	T2 -	
3.4	Buffer of 2nd oscillator (level, channel A)	-	Spectrum analyser	TP13	76.45 MHz: max. level, approx. - 34 ...- 26 dBm; 65.75 MHz: approx. - 32 ...- 24 dBm	T102 -	
4	RF input channel B	Tracking generator at J1, - 20 dBm	Spectrum analyser	TP1 on solder side	B: 27 MHz, approx. - 40 ...- 25 dBm	C4, C10, C15	
4.1	RF input channel A	Tracking generator at J101, - 20 dBm	Spectrum analyser	TP11 on solder side	B: 27 MHz, approx. - 40...- 25 dBm	C104, C110, C115	
5	Demodulator channel B	RF signal generator at J1: receiver frequency, RF: 1 mV, deviation: 40 kHz, modulation: 1 kHz	AF voltmeter oscilloscope	J4	max. level	T3	
5.1	AF amplifier channel B	as 5	AF voltmeter, oscilloscope	J4	2.9 V_{eff}	R309	

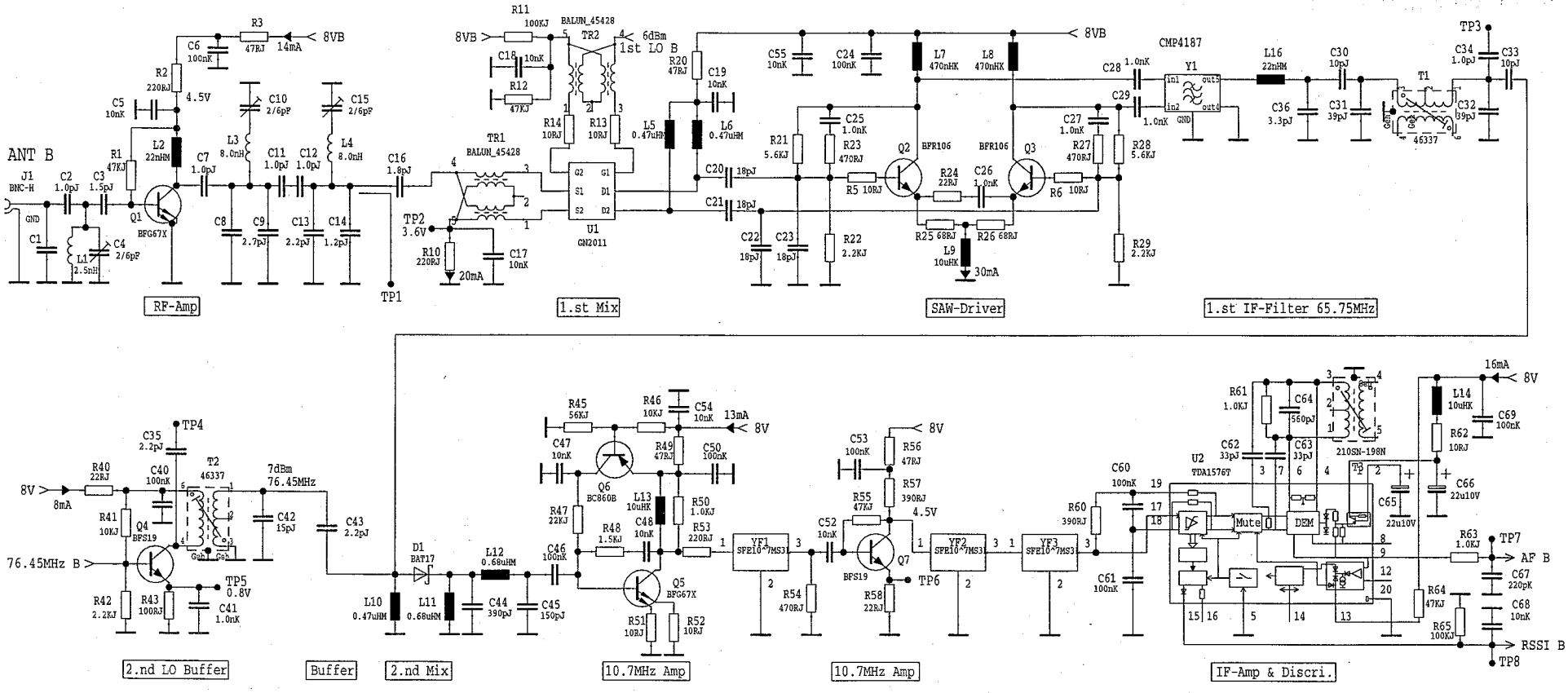
5.2	Demodulator channel B (fine adjustment)	as 5.1	THD meter	J4	THD < 0.4 %	T3	Repeat 5.1 if necessary.
5.3	Sensitivity channel B	RF signal generator at J1: receiver frequency, RF: 1 mV ... 3 µV, deviation: off	AF voltmeter (A-weighted, effective), oscilloscope	J4	min. noise, - 74 ... - 82 dBu at 3 µV	C4, C10, C15, T1	Reduce RF input voltage and adjust to minimum noise.
5.4	Demodulator channel A	RF signal generator at J101: receiver frequency, RF: 1 mV, deviation: 40 kHz, modulation: 1 kHz	AF voltmeter, oscilloscope	J4	max. level	T103	
5.5	AF amplifier channel A	as 5.4	AF voltmeter, oscilloscope	J4	2.9 V_{eff}	R302	
5.6	Demodulator channel A (fine adjustment)	as 5.5	THD meter	J4	THD < 0.4 %	T103	Repeat 5.5 if necessary.
5.7	Sensitivity channel A	RF signal generator at J101: receiver frequency, RF: 1 mV ... 3 µV, deviation: off	AF voltmeter (A-weighted, effective), oscilloscope	J4	min. noise, - 74 ... - 82 dBu at 3 µV	C104, C110, C115, T101	Reduce RF input voltage and optimise adjustment.
6	RF level display channel A (10 dBµV)	RF signal generator at J101: receiver frequency, RF: 3 µV, deviation: 40 kHz, modulation: 1 kHz	Turn trimming resistor R380 to min.	LED display RF LEVEL	1st LED lights up (D452)	R372	
6.1	RF level display channel A (40 dBµV)	RF: 100 µV, otherwise as 6	-	LED display RF LEVEL	7th LED lights up (D458)	R370	Alternate 6 and 6.1 until the LED display indicates correct values.
6.2	RF level display channel B (10 dBµV)	RF signal generator at J1: receiver frequency, RF: 3 µV, deviation: 40 kHz, modulation: 1 kHz	-	LED display RF LEVEL	1st LED lights up (D452)	R377	
6.3	RF level display channel B (40 dBµV)	RF: 100 µV, otherwise as 6.2	-	LED display RF LEVEL	7th LED lights up (D458)	R380	Alternate 6.2 and 6.3 until the LED display indicates correct values.
7	Checking the sensitivity channel B	RF signal generator at J1: receiver frequency, RF: 3 µV, deviation: off	AF voltmeter (A-weighted, effective), oscilloscope	J4	min. noise < - 74 dBu		
7.1	Checking the sensitivity at the frequency limits, channel B	as 7	Set S1 to lowest and highest receiving frequency; AF voltmeter (A-weighted, effective), oscilloscope	J4	min. noise < - 68 dBu	Optimise with C4, C10, and C15 if necessary.	
7.2	Checking the sensitivity channel A	RF signal generator at J101: receiver frequency, RF: 3 µV, deviation: off	AF voltmeter (A-weighted, effective), oscilloscope	J4	min. noise < - 74 dBu		
7.3	Checking the sensitivity at the frequency limits, channel A	as 7.2	Set S1 to lowest and highest receiving frequency; AF voltmeter (A-weighted, effective), oscilloscope	J4	min. noise < - 68 dBu	Optimise with C104, C110, and C115 if necessary.	

7.4	Max. signal-to-noise ratio channel A	RF: 1 mV, otherwise as 7.3	Set S1 to medium receiving frequency of switching bandwidth, AF voltmeter (unweighted)	J4	approx. - 97 dBu		
7.5	Max. signal-to-noise ratio channel B	RF signal generator at J1: otherwise as 7.4	as 7.4	J4	approx. - 97 dBu		
8	AF frequency response channel B	RF: 1 mV, deviation: 40 kHz, modulation: 1 kHz, otherwise as 7.5	as 7.5	J4	11.4 dBu (0 dB)		
8.1	AF frequency response channel B	modulation: 30 Hz, otherwise as 8	as 8	J4	2.9 ... 4.9 dBu (- 6.5 ...- 8.5 dB)		
8.2	AF frequency response channel B	modulation: 10 kHz, otherwise as 8.1	as 8.1	J4	- 6.1...- 8.1 dBu (- 17.5...- 19.5 dB)		
8.3	AF frequency response channel A	RF signal generator at J101: RF: 1 mV, deviation: 40 kHz, modulation: 1 kHz; otherwise as 8.2	as 8.2	J4	11.4 dBu (0 dB)		
8.4	AF frequency response channel A	modulation: 30 Hz; otherwise as 8.3	as 8.3	J4	2.9 ... 4.9 dBu (- 6.5 ...- 8.5 dB)		
8.5	AF frequency response channel A	modulation: 10 kHz; otherwise as 8.4	as 8.4	J4	- 6.1 ...- 8.1 dBu (- 17.5 ...- 19.5 dB)		
8.6	THD channel A	deviation: 56 kHz, modulation: 1 kHz; otherwise as 8.5	THD meter	J4	THD < 0.5 %	Optimise with T103 if necessary.	From a deviation of approx. 51 kHz up, the "+ 12 dB" LED of the AF level display lights up.
8.7	THD channel B	RF signal generator at J1: otherwise as 8.6	THD meter	J4	THD < 0.5 %	Optimise with T3 if necessary.	From a deviation of approx. 51 kHz up, the "+ 12 dB" LED of the AF level display lights up.
9	Level-controlled squelch channel B	RF: approx. 1.5 µV; otherwise as 8.7	AF voltmeter	J4	AF output is muted		
9.1	Level-controlled squelch channel A	RF signal generator at J1: RF: approx. 1.5 µV; otherwise as 9	AF voltmeter	J4	AF output is muted		
9.2	Noise-controlled squelch channel A	RF: 1 mV, deviation: approx. 60 kHz, modulation: 50 kHz; otherwise as 9.1	AF voltmeter	J4	AF output is muted		

NOTES:



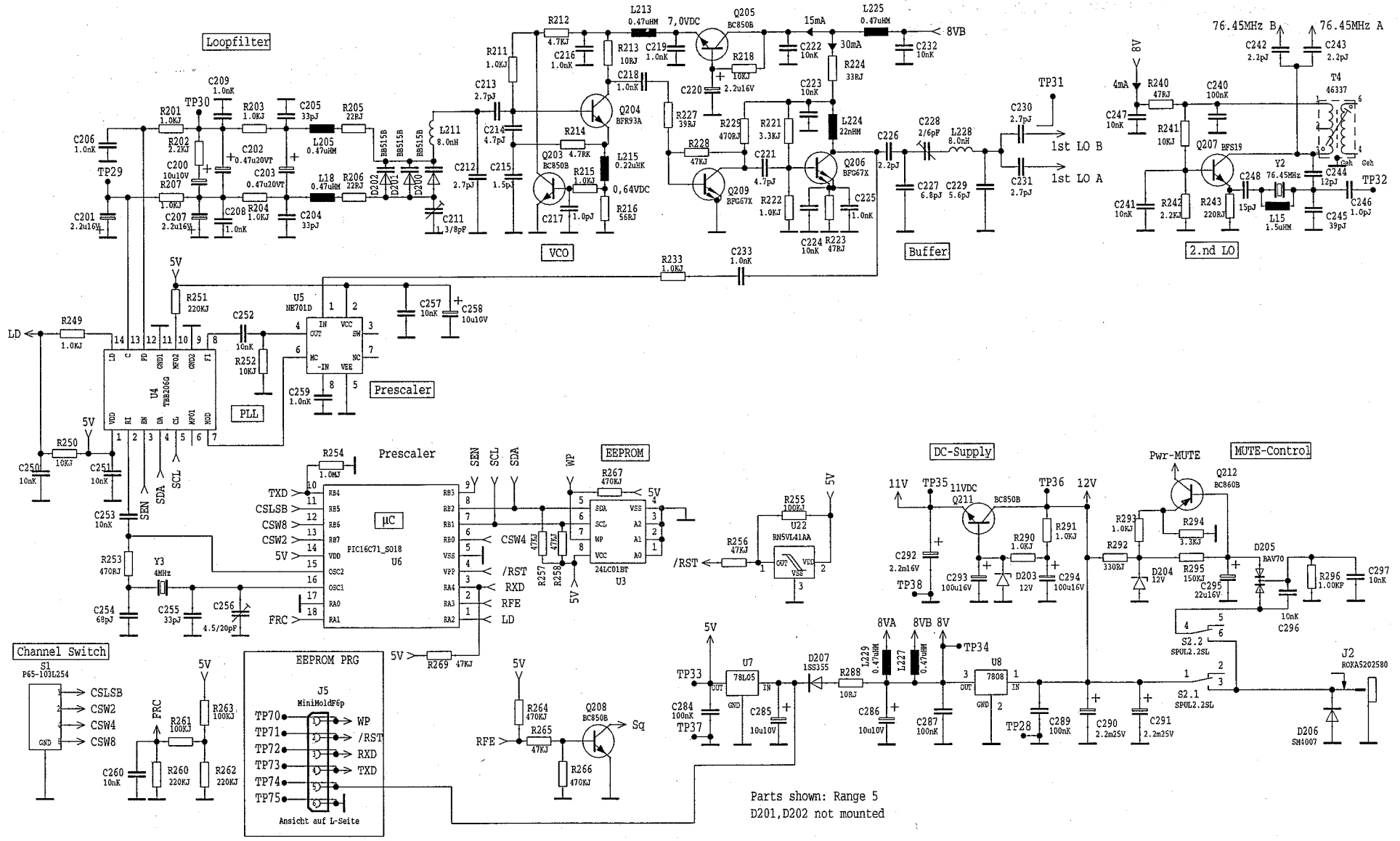
EM1031-U, BLOCKSCHALTBILD
EM1031-U, BLOCK DIAGRAM



No.	Freq. MHz	RF-Amplifier																	Code-Resistors				
		C1	C2	L1	C3	C4	C7	C8	C9	L3	C10	C11	C12	L4	C13	C14	C15	C16	R501	R502	R503	R504	R505
1																			1k	-	-	-	-
2																			-	1k	-	-	-
3	574-702	-	2p2	2n5	3p3	3/10p	1p5	2p7	1p5	12n5	3/10p	1p5	1p5	12n5	2p7	2p7	3/10p	1p5	-	-	1k	-	-
4	678-814	-	1p5	2n5	2p2	2/6p	1p5	1p0	1p5	12n5	2/6p	1p5	1p5	12n5	1p5	1p5	2/6p	1p5	-	-	-	1k	-
5	798-960	-	1p0	2n5	1p5	2/6p	1p0	-	2p7	8n0	2/6p	1p0	1p0	8n0	2p2	1p2	2/6p	1p8	-	-	-	-	1k

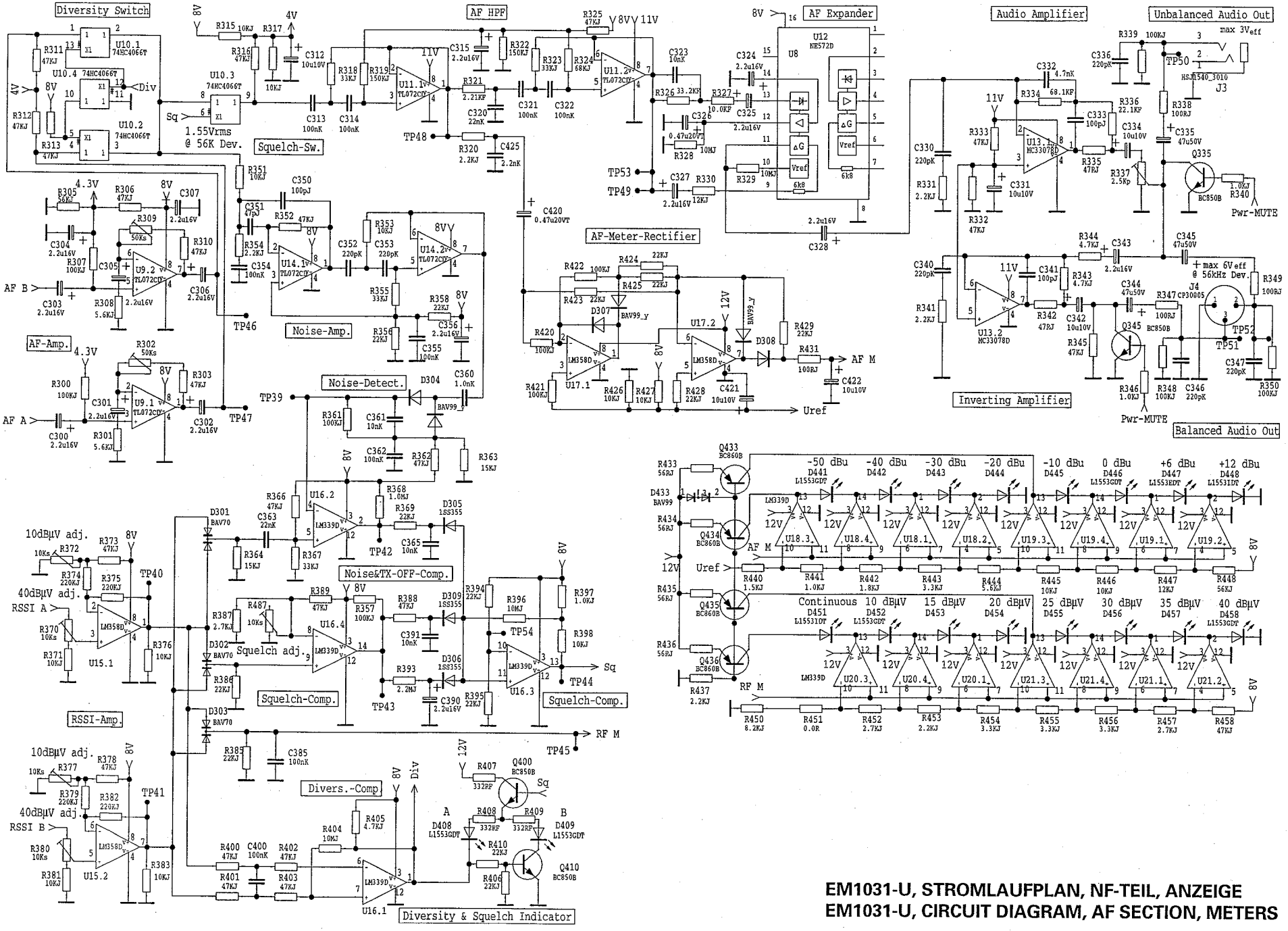
Parts shown: Range 5

EM1031-U, STROMLAUFPLAN, HF-TEIL, TUNER
EM1031-U, CIRCUIT DIAGRAM, RF SECTION, TUNER



No.	Freq. MHz	VCO										BUFFER								µC Range		
		L205	L18	L211	C212	C213	C214	C215	C217	R214	R215	C221	C226	C227	C228	L228	C229	C230	C231	R260	R262	R263
1																				220k	-	-
2																				220k	220k	100k
3	574-702	46559	46559	18n5	4p7	3p9	6p8	3p3	-	10R	2K2	4p7	2p7	8p2	3/10p	12n5	8p2	5p6	5p6	220k	-	100k
4	678-814	46559	46559	12n5	4p7	3p3	4p7	1p8	-	10R	1K0	4p7	3p3	8p2	3/10p	8n0	10p	4p7	8p2	-	220k	100k
5	798-960	45681	45681	8n0	2p7	2p7	4p7	1p5	-	4R7	1K0	4p7	2p2	6p8	2/6p	8n0	5p6	2p7	2p7	-	-	100k

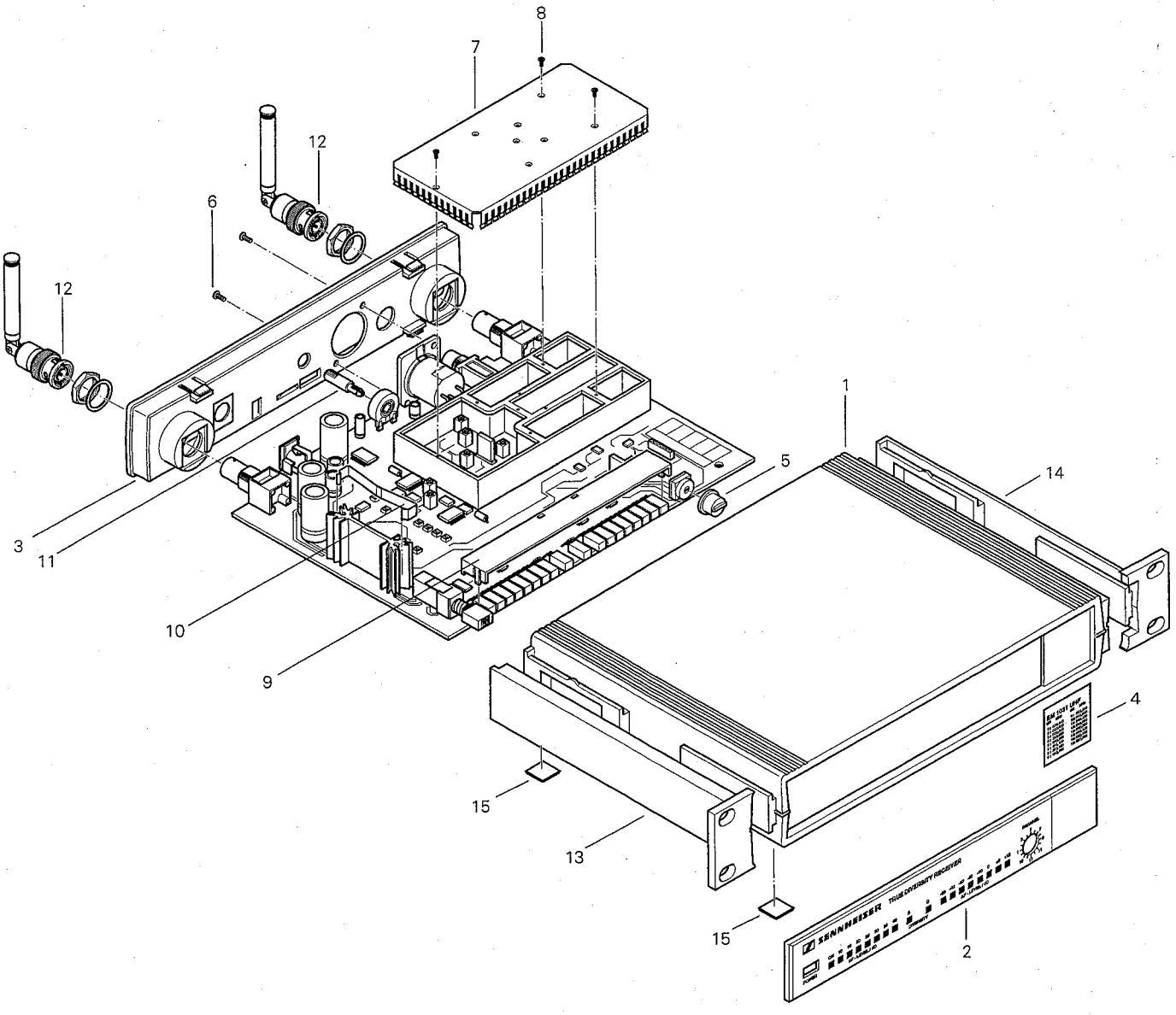
EM1031-U, STROMLAUFPLAN, PLL, ZF-TEIL
EM1031-U, CIRCUIT DIAGRAM, PLL, IF SECTION



EM1031-U, STROMLAUFPLAN, NF-TEIL, ANZEIGE
EM1031-U, CIRCUIT DIAGRAM, AF SECTION, METERS

12 EXPLOSIONSZEICHNUNG

12 EXPLODED VIEW



13 ERSATZTEILE

13 SPARE PARTS

POS	IDENT	BEZEICHNUNG	DESCRIPTION
001	54459	Gehäuse	Housing
002	54463	Blende "Receiver"	Cover "Receiver"
003	54461	Rückwand	Rear panel
004	54786	Schild	Label
005	55925	Knopf	Knob
006	53282	Zylinderschraube	Cheese head screw
007	56947	Deckel	Cover
008	53279	Linsenschraube CM2x4 DIN7500	Lens screw CM2x4 DIN7500
009	55749	Diodenhalter	Diode holder
010	54377	Clip	Clip
011	21540	Steckwelle	Shaft extension
012	54378	Antenne	Antenna
013	54755	Seitenteil für 19", links	Cheek for 19", left part
014	54757	Seitenteil für 19", rechts	Cheek for 19", right part
015	70506	Fuß	Foot
C002A	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x) 574-702MHz
C002B	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C002C	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1pF 50V NPO (MOQ:50x) 798-960MHz
C003A	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 3.3pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C003B	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x) 678-814MHz
C003C	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C004A	45365	SMD Trimmkondensator 3,0/10pF (MOQ:50x) 574-702MHz	SMD capacitor variable 3.0/10pF (MOQ:50x) 574-702MHz
C004B	45364	SMD Trimmkondensator 2,0/6,0pF (MOQ:50x) 678-960MHz	SMD capacitor variable 2.0/6.0pF (MOQ:50x) 678-960MHz
C005	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C006	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C007A	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C007B	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1pF 50V NPO (MOQ:50x) 798-960MHz
C008A	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C008B	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 1pF 50V NPO (MOQ:50x) 678-814MHz
C009A	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C009B	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C010A	45365	SMD Trimmkondensator 3,0/10pF (MOQ:50x) 574-702MHz	SMD capacitor variable 3.0/10pF (MOQ:50x) 574-702MHz
C010B	45364	SMD Trimmkondensator 2,0/6,0pF (MOQ:50x) 678-960MHz	SMD capacitor variable 2.0/6.0pF (MOQ:50x) 678-960MHz
C011A	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C011B	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1pF 50V NPO (MOQ:50x) 798-960MHz
C012A	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C012B	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1pF 50V NPO (MOQ:50x) 798-960MHz
C013A	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C013B	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C013C	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x) 798-960MHz
C014A	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C014B	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C014C	45740	SMD Kondensator KERKO 1,2pF 50V NPO (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1.2pF 50V NPO (MOQ:50x) 798-960MHz
C015A	45365	SMD Trimmkondensator 3,0/10pF (MOQ:50x) 574-702MHz	SMD capacitor variable 3.0/10pF (MOQ:50x) 574-702MHz

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C015B	45364	SMD Trimmkondensator 2,0/6,0pF (MOQ:50x) 678-960MHz	SMD capacitor variable 2.0/6.0pF (MOQ:50x) 678-960MHz
C016A	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C016B	29562	SMD Kondensator KERKO 1,8pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1.8pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C017	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C018	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C019	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C020	29143	SMD Kondensator KERKO 18pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 18pF 50V NP0 0805 (MOQ:50x)
C021	29143	SMD Kondensator KERKO 18pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 18pF 50V NP0 0805 (MOQ:50x)
C022	29143	SMD Kondensator KERKO 18pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 18pF 50V NP0 0805 (MOQ:50x)
C023	29143	SMD Kondensator KERKO 18pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 18pF 50V NP0 0805 (MOQ:50x)
C024	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C025	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C026	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C027	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C028	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C029	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C030	19617	SMD Kondensator KERKO 10pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 10pF 50V NP0 0805 (MOQ:50x)
C031	45181	SMD Kondensator KERKO 39pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 39pF 50V NP0 (MOQ:50x)
C032	45181	SMD Kondensator KERKO 39pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 39pF 50V NP0 (MOQ:50x)
C033	19617	SMD Kondensator KERKO 10pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 10pF 50V NP0 0805 (MOQ:50x)
C034	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 1pF 50V NP0 (MOQ:50x)
C035	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x)
C036	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 3.3pF 50V NP0 0805 (MOQ:50x)
C040	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C041	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C042	29142	SMD Kondensator KERKO 15pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 15pF 50V NP0 0805 (MOQ:50x)
C043	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x)
C044	29149	SMD Kondensator KERKO 390pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 390pF 50V NP0 0805 (MOQ:50x)
C045	45188	SMD Kondensator KERKO 150pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 150pF 50V NP0 (MOQ:50x)
C046	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C047	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C048	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C050	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C052	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C053	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C054	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C055	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C060	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C061	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C062	45180	SMD Kondensator KERKO 33pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 33pF 50V NP0 (MOQ:50x)
C063	45180	SMD Kondensator KERKO 33pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 33pF 50V NP0 (MOQ:50x)
C064	28836	SMD Kondensator KERKO 560pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 560pF 50V NP0 (MOQ:50x)
C065	41415	SMD Kondensator TA-ELKO 22uF 10V	SMD capacitor TA-ELKO 22uF 10V
C066	41415	SMD Kondensator TA-ELKO 22uF 10V	SMD capacitor TA-ELKO 22uF 10V
C067	45191	SMD Kondensator KERKO 220pF 50V X7R (MOQ:50x)	SMD capacitor KERKO 220pF 50V X7R (MOQ:50x)
C068	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C069	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C102A	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x) 574-702MHz
C102B	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C102C	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1pF 50V NP0 (MOQ:50x) 798-960MHz
C103A	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C103B	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x) 678-814MHz
C103C	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C104A	45365	SMD Trimmkondensator 3,0/10pF (MOQ:50x) 574-702MHz	SMD capacitor variable 3.0/10pF (MOQ:50x) 574-702MHz
C104B	45364	SMD Trimmkondensator 2,0/6,0pF (MOQ:50x) 678-960MHz	SMD capacitor variable 2.0/6.0pF (MOQ:50x) 678-960MHz
C105	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C106	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C107A	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C107B	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1pF 50V NP0 (MOQ:50x) 798-960MHz

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C108A	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C108B	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 1pF 50V NPO (MOQ:50x) 678-814MHz
C109A	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C109B	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C110A	45365	SMD Trimmkondensator 3,0/10pF (MOQ:50x) 574-702MHz	SMD capacitor variable 3.0/10pF (MOQ:50x) 574-702MHz
C110B	45364	SMD Trimmkondensator 2,0/6,0pF (MOQ:50x) 678-960MHz	SMD capacitor variable 2.0/6.0pF (MOQ:50x) 678-960MHz
C111A	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C111B	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1pF 50V NPO (MOQ:50x) 798-960MHz
C112A	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C112B	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1pF 50V NPO (MOQ:50x) 798-960MHz
C113A	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C113B	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C113C	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x) 798-960MHz
C114A	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C114B	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C114C	45740	SMD Kondensator KERKO 1,2pF 50V NPO (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1.2pF 50V NPO (MOQ:50x) 798-960MHz
C115A	45355	Stiftleiste DIN41651 574-702MHz	Edge connector DIN41651 574-702MHz
C115B	45364	SMD Trimmkondensator 2,0/6,0pF (MOQ:50x) 678-960MHz	SMD capacitor variable 2.0/6.0pF (MOQ:50x) 678-960MHz
C116A	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C116B	29562	SMD Kondensator KERKO 1,8pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1.8pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C117	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C118	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C119	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C120	29142	SMD Kondensator KERKO 15pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 15pF 50V NP0 0805 (MOQ:50x)
C121	29142	SMD Kondensator KERKO 15pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 15pF 50V NP0 0805 (MOQ:50x)
C122	19584	SMD Kondensator KERKO 22pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 22pF 50V NP0 0805 (MOQ:50x)
C123	19584	SMD Kondensator KERKO 22pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 22pF 50V NP0 0805 (MOQ:50x)
C124	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C125	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C126	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C127	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C128	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C129	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C130	19617	SMD Kondensator KERKO 10pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 10pF 50V NP0 0805 (MOQ:50x)
C131	45181	SMD Kondensator KERKO 39pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 39pF 50V NPO (MOQ:50x)
C132	45181	SMD Kondensator KERKO 39pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 39pF 50V NPO (MOQ:50x)
C133	19617	SMD Kondensator KERKO 10pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 10pF 50V NP0 0805 (MOQ:50x)
C134	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 1pF 50V NPO (MOQ:50x)
C135	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x)
C136	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 3.3pF 50V NP0 0805 (MOQ:50x)
C140	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C141	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C142	29142	SMD Kondensator KERKO 15pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 15pF 50V NP0 0805 (MOQ:50x)
C143	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x)
C144	29149	SMD Kondensator KERKO 390pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 390pF 50V NP0 0805 (MOQ:50x)
C145	45188	SMD Kondensator KERKO 150pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 150pF 50V NPO (MOQ:50x)
C146	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C147	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C148	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C150	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C152	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C153	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C154	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C155	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C160	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C161	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C162	45180	SMD Kondensator KERKO 33pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 33pF 50V NPO (MOQ:50x)
C163	45180	SMD Kondensator KERKO 33pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 33pF 50V NPO (MOQ:50x)
C164	28836	SMD Kondensator KERKO 560pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 560pF 50V NP0 (MOQ:50x)
C165	41415	SMD Kondensator TA-ELKO 22uF 10V	SMD capacitor TA-ELKO 22uF 10V
C166	41415	SMD Kondensator TA-ELKO 22uF 10V	SMD capacitor TA-ELKO 22uF 10V
C167	45191	SMD Kondensator KERKO 220pF 50V X7R (MOQ:50x)	SMD capacitor KERKO 220pF 50V X7R (MOQ:50x)
C168	45191	SMD Kondensator KERKO 220pF 50V X7R (MOQ:50x)	SMD capacitor KERKO 220pF 50V X7R (MOQ:50x)
C169	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C200	45010	SMD Kondensator TA-KO 10uF 4V ERO ETPW1	SMD capacitor TA-KO 10uF 4V ERO ETPW1
C201	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C202	45050	SMD Kondensator TA-KO 470nF 20V	SMD Capacitor TA-KO 470nF 20V
C203	45050	SMD Kondensator TA-KO 470nF 20V	SMD Capacitor TA-KO 470nF 20V
C204	45180	SMD Kondensator KERKO 33pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 33pF 50V NPO (MOQ:50x)
C205	45180	SMD Kondensator KERKO 33pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 33pF 50V NPO (MOQ:50x)
C206	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C207	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C208	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C209	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C211	45696	Trimmkondensator 1,8p/10p	Capacitor, variable 1.8p/10p
C212A	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 4.7pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C212B	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C213A	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 3.9pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C213B	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 3.3pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C213C	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C214A	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 6.8pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C214B	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805 (MOQ:50x) 678-960MHz	SMD capacitor KERKO 4.7pF 50V NP0 0805 (MOQ:50x) 678-960MHz
C215A	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 3.3pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C215B	29562	SMD Kondensator KERKO 1,8pF 50V NP0 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 1.8pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C215C	29012	SMD Kondensator KERKO 1,5pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 1.5pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C216	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C218	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C219	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C220	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C221	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805 (MOQ:50x) 574-960MHz	SMD capacitor KERKO 4.7pF 50V NP0 0805 (MOQ:50x) 574-960MHz
C222	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C223	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C224	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C225	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C226A	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C226B	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 3.3pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C226C	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x) 798-960MHz
C227A	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805 (MOQ:50x) 574-814MHz	SMD capacitor KERKO 8.2pF 50V NP0 0805 (MOQ:50x) 574-814MHz
C227B	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 6.8pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C228A	45365	SMD Trimmkondensator 3,0/10pF (MOQ:50x) 574-814MHz	SMD capacitor variable 3.0/10pF (MOQ:50x) 574-814MHz
C228B	45364	SMD Trimmkondensator 2,0/6,0pF (MOQ:50x) 798-960MHz	SMD capacitor variable 2.0/6.0pF (MOQ:50x) 798-960MHz
C229A	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 8.2pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C229B	19617	SMD Kondensator KERKO 10pF 50V NP0 0805 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 10pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C229C	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 5.6pF 50V NP0 0805 (MOQ:50x) 798-960MHz

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C230A	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 5.6pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C230B	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 4.7pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C230C	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C231A	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805 (MOQ:50x) 574-702MHz	SMD capacitor KERKO 5.6pF 50V NP0 0805 (MOQ:50x) 574-702MHz
C231B	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805 (MOQ:50x) 678-814MHz	SMD capacitor KERKO 8.2pF 50V NP0 0805 (MOQ:50x) 678-814MHz
C231C	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805 (MOQ:50x) 798-960MHz	SMD capacitor KERKO 2.7pF 50V NP0 0805 (MOQ:50x) 798-960MHz
C232	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C233	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C240	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C241	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C242	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x)
C243	29011	SMD Kondensator KERKO 2,2pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 2.2pF 50V NP0 (MOQ:50x)
C244	29141	SMD Kondensator KERKO 12pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 12pF 50V NP0 0805 (MOQ:50x)
C245	45181	SMD Kondensator KERKO 39pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 39pF 50V NPO (MOQ:50x)
C246	29014	SMD Kondensator KERKO 1pF 50V NP0 (MOQ:50x)	SMD capacitor KERKO 1pF 50V NPO (MOQ:50x)
C247	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C248	29142	SMD Kondensator KERKO 15pF 50V NP0 0805 (MOQ:50x)	SMD capacitor KERKO 15pF 50V NP0 0805 (MOQ:50x)
C250	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C251	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C252	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C253	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C254	45184	SMD Kondensator KERKO 68pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 68pF 50V NPO (MOQ:50x)
C255	45180	SMD Kondensator KERKO 33pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 33pF 50V NPO (MOQ:50x)
C256	45363	SMD Trimmkondensator 4,5/20pF (MOQ:50x)	SMD capacitor variable 4.5/20pF (MOQ:50x)
C257	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C258	45010	SMD Kondensator TA-KO 10uF 4V ERO ETPW1	SMD capacitor TA-KO 10uF 4V ERO ETPW1
C259	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C260	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C284	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C285	45010	SMD Kondensator TA-KO 10uF 4V ERO ETPW1	SMD capacitor TA-KO 10uF 4V ERO ETPW1
C286	45010	SMD Kondensator TA-KO 10uF 4V ERO ETPW1	SMD capacitor TA-KO 10uF 4V ERO ETPW1
C287	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C289	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C290	45698	Kondensator AL-ELKO 2,2mF 25V CA	Kondensator AL-ELKO 2.2mF 25V CA
C291	45698	Kondensator AL-ELKO 2,2mF 25V CA	Kondensator AL-ELKO 2.2mF 25V CA
C292	45697	Kondensator AL-ELKO 2,2mF 16V CA	Capacitor AL-ELKO 2.2mF 16V CA
C293	24566	Kondensator AL-ELKO 100uF 16V	Capacitor AL-ELKO 100uF 16V
C294	24566	Kondensator AL-ELKO 100uF 16V	Capacitor AL-ELKO 100uF 16V
C295	27962	Kondensator AL-ELKO 22uF 16V CA	Capacitor AL-ELKO 22uF 16V CA
C296	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C297	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C300	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C301	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C302	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C303	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C304	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C305	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C306	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C307	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C312	45010	SMD Kondensator TA-KO 10uF 4V ERO ETPW1	SMD capacitor TA-KO 10uF 4V ERO ETPW1
C313	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C314	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C315	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C320	32118	SMD Kondensator KERKO 22nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 22nF 50V X7R (MOQ:50x)
C321	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C322	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C323	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C324	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C325	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C326	45050	SMD Kondensator TA-KO 470nF 20V	SMD Capacitor TA-KO 470nF 20V
C327	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C328	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C330	45191	SMD Kondensator KERKO 220pF 50V X7R (MOQ:50x)	SMD capacitor KERKO 220pF 50V X7R (MOQ:50x)
C331	45010	SMD Kondensator TA-KO 10uF 4V ERO ETPW1	SMD capacitor TA-KO 10uF 4V ERO ETPW1
C332	45199	SMD Kondensator KERKO 4,7nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 4.7nF 50X X7R (MOQ:50x)
C333	45186	SMD Kondensator KERKO 100pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 100pF 50V NPO (MOQ:50x)
C334	45010	SMD Kondensator TA-KO 10uF 4V ERO ETPW1	SMD capacitor TA-KO 10uF 4V ERO ETPW1

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C335	45545	Kondensator AL-ELKO 47uF 50V (MOQ:50x)	Capacitor AL-ELKO 47uF 50V (MOQ:50x)
C336	45191	SMD Kondensator KERKO 220pF 50V X7R (MOQ:50x)	SMD capacitor KERKO 220pF 50V X7R (MOQ:50x)
C340	45191	SMD Kondensator KERKO 220pF 50V X7R (MOQ:50x)	SMD capacitor KERKO 220pF 50V X7R (MOQ:50x)
C341	45186	SMD Kondensator KERKO 100pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 100pF 50V NPO (MOQ:50x)
C342	45010	SMD Kondensator TA-KO 10uF 4V ERO ETPW1	SMD capacitor TA-KO 10uF 4V ERO ETPW1
C343	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C344	45545	Kondensator AL-ELKO 47uF 50V (MOQ:50x)	Capacitor AL-ELKO 47uF 50V (MOQ:50x)
C345	45545	Kondensator AL-ELKO 47uF 50V (MOQ:50x)	Capacitor AL-ELKO 47uF 50V (MOQ:50x)
C346	45191	SMD Kondensator KERKO 220pF 50V X7R (MOQ:50x)	SMD capacitor KERKO 220pF 50V X7R (MOQ:50x)
C347	45191	SMD Kondensator KERKO 220pF 50V X7R (MOQ:50x)	SMD capacitor KERKO 220pF 50V X7R (MOQ:50x)
C350	45186	SMD Kondensator KERKO 100pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 100pF 50V NPO (MOQ:50x)
C351	45182	SMD Kondensator KERKO 47pF 50V NPO (MOQ:50x)	SMD capacitor KERKO 47pF 50V NPO (MOQ:50x)
C352	45191	SMD Kondensator KERKO 220pF 50V X7R (MOQ:50x)	SMD capacitor KERKO 220pF 50V X7R (MOQ:50x)
C353	45191	SMD Kondensator KERKO 220pF 50V X7R (MOQ:50x)	SMD capacitor KERKO 220pF 50V X7R (MOQ:50x)
C355	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C356	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C360	45195	SMD Kondensator KERKO 1nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 1nF 50V X7R (MOQ:50x)
C361	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C362	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C363	32118	SMD Kondensator KERKO 22nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 22nF 50V X7R (MOQ:50x)
C365	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C385	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C390	45043	SMD Kondensator TA-KO 2,2uF 16V IEC 384,3	SMD capacitor TA-KO 2.2uF 16V IEC 384,3
C391	45201	SMD Kondensator KERKO 10nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 10nF 50V X7R (MOQ:50x)
C400	19480	SMD Kondensator KERKO 100nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 100nF 50V X7R (MOQ:50x)
C420	45050	SMD Kondensator TA-KO 470nF 20V	SMD Capacitor TA-KO 470nF 20V
C421	45010	SMD Kondensator TA-KO 10uF 4V ERO ETPW1	SMD capacitor TA-KO 10uF 4V ERO ETPW1
C422	45010	SMD Kondensator TA-KO 10uF 4V ERO ETPW1	SMD capacitor TA-KO 10uF 4V ERO ETPW1
C425	45197	SMD Kondensator KERKO 2,2nF 50V X7R (MOQ:50x)	SMD capacitor KERKO 2.2nF 50V X7R (MOQ:50x)
D001	37550	SMD Diode BAT17 SOT 23	SMD diode BAT17 SOT23
D101	37550	SMD Diode BAT17 SOT 23	SMD diode BAT17 SOT23
D200	41275	SMD Varicap BB515B SOD123 SUP8	SMD Varicap BB515B SOD123 SUP8
D203	45412	SMD Z-Diode Mini-MELF ZMM12-2	SMD Z diode Mini-MELF ZMM12-2
D204	45412	SMD Z-Diode Mini-MELF ZMM12-2	SMD Z diode Mini-MELF ZMM12-2
D205	45253	SMD Doppeldiode BAV70 SOT23	SMD diodes (two) BAV70 SOT23
D206	39667	SMD Diode SM 4007	SMD diode SM 4007
D207	45444	SMD Diode 1SS355	SMD diode 1SS355
D301	45253	SMD Doppeldiode BAV70 SOT23	SMD diodes (two) BAV70 SOT23
D302	45253	SMD Doppeldiode BAV70 SOT23	SMD diodes (two) BAV70 SOT23
D303	45253	SMD Doppeldiode BAV70 SOT23	SMD diodes (two) BAV70 SOT23
D304	32642	SMD Doppeldiode BAV99 SOT23	SMD diodes (two) BAV99 SOT23
D305	45444	SMD Diode 1SS355	SMD diode 1SS355
D306	45444	SMD Diode 1SS355	SMD diode 1SS355
D307	32642	SMD Doppeldiode BAV99 SOT23	SMD diodes (two) BAV99 SOT23
D308	32642	SMD Doppeldiode BAV99 SOT23	SMD diodes (two) BAV99 SOT23
D309	45444	SMD Diode 1SS355	SMD diode 1SS355
D408	45680	LED, rot	LED, red
D409	45680	LED, rot	LED, red
D433	32642	SMD Doppeldiode BAV99 SOT23	SMD diodes (two) BAV99 SOT23
D441	45680	LED, rot	LED, red
D442	45680	LED, rot	LED, red
D443	45680	LED, rot	LED, red
D444	45680	LED, rot	LED, red
D445	45680	LED, rot	LED, red
D446	45680	LED, rot	LED, red
D447	45708	LED	LED
D448	45679	LED, rot	LED, red
D451	45679	LED, rot	LED, red
D452	45680	LED, rot	LED, red
D453	45680	LED, rot	LED, red
D454	45680	LED, rot	LED, red
D455	45680	LED, rot	LED, red
D456	45680	LED, rot	LED, red
D457	45680	LED, rot	LED, red
D458	45680	LED, rot	LED, red
J001	45706	Buchse, Winkelklinke BNC 50R	Socket BNC 50R
J002	45409	Hohlklinkenbuchse	Jack bush
J003	45695	Klinkenbuchse 6,3mm	Jack socket 6,3mm
J004	45676	Einbaustecker XLR3M	Socket XLR3M
J101	45706	Buchse, Winkelklinke BNC 50R	Socket BNC 50R
L001	45684	SMD Luftspule 2,5nH	SMD air core coil 2.5nH
L002	45704	SMD Spule 22nH	SMD coil 22nH

POS	IDENT	BEZEICHNUNG	DESCRIPTION
L003A	45685	SMD Luftspule 12,5nH 574-814MHz	SMD air core coil 12.5nH 574-814MHz
L003B	45725	SMD Luftspule 8nH 798-960MHz	SMD air core coil 8nH 798-960MHz
L004A	45685	SMD Luftspule 12,5nH 574-814MHz	SMD air core coil 12.5nH 574-814MHz
L004B	45725	SMD Luftspule 8nH 798-960MHz	SMD air core coil 8nH 798-960MHz
L005	45681	SMD Spule 470nH	SMD coil 470nH
L006	45681	SMD Spule 470nH	SMD coil 470nH
L007	46559	SMD Spule 470nH	SMD coil 470nH
L008	46559	SMD Spule 470nH	SMD coil 470nH
L009	45683	SMD Spule 10uH	SMD coil 10uH
L010	45681	SMD Spule 470nH	SMD coil 470nH
L011	45682	SMD Spule 680nH	SMD coil 680nH
L012	45682	SMD Spule 680nH	SMD coil 680nH
L013	45683	SMD Spule 10uH	SMD coil 10uH
L014	45683	SMD Spule 10uH	SMD coil 10uH
L015	34676	SMD Drossel 1,5uH	SMD inductor 1.5uH
L016	45704	SMD Spule 22nH	SMD coil 22nH
L018A	46559	SMD Spule 470nH 574-814MHz	SMD coil 470nH 574-814MHz
L018B	45681	SMD Spule 470nH 798-960MHz	SMD coil 470nH 798-960MHz
L101	45684	SMD Luftspule 2,5nH	SMD air core coil 2.5nH
L102	45704	SMD Spule 22nH	SMD coil 22nH
L103A	45685	SMD Luftspule 12,5nH 574-814MHz	SMD air core coil 12.5nH 574-814MHz
L103B	45725	SMD Luftspule 8nH 798-960MHz	SMD air core coil 8nH 798-960MHz
L104A	45685	SMD Luftspule 12,5nH 574-814MHz	SMD air core coil 12.5nH 574-814MHz
L104B	45725	SMD Luftspule 8nH 798-960MHz	SMD air core coil 8nH 798-960MHz
L105	45681	SMD Spule 470nH	SMD coil 470nH
L106	45681	SMD Spule 470nH	SMD coil 470nH
L107	46559	SMD Spule 470nH	SMD coil 470nH
L108	46559	SMD Spule 470nH	SMD coil 470nH
L109	45683	SMD Spule 10uH	SMD coil 10uH
L110	45681	SMD Spule 470nH	SMD coil 470nH
L111	45682	SMD Spule 680nH	SMD coil 680nH
L112	45682	SMD Spule 680nH	SMD coil 680nH
L113	45683	SMD Spule 10uH	SMD coil 10uH
L114	45683	SMD Spule 10uH	SMD coil 10uH
L116	45704	SMD Spule 22nH	SMD coil 22nH
L205A	46559	SMD Spule 470nH 574-814MHz	SMD coil 470nH 574-814MHz
L205B	45681	SMD Spule 470nH 798-960MHz	SMD coil 470nH 798-960MHz
L211A	45849	SMD Luftspule 18,5nH 574-702MHz	SMD air core coil 18.5nH 574-702MHz
L211B	45685	SMD Luftspule 12,5nH 678-814MHz	SMD air core coil 12.5nH 678-814MHz
L211C	45725	SMD Luftspule 8nH 798-960MHz	SMD air core coil 8nH 798-960MHz
L213	45681	SMD Spule 470nH	SMD coil 470nH
L215	45705	SMD Spule 220nH SUP8 (MOQ:50x)	SMD coil 220nH SUP8 (MOQ:50x)
L224	45704	SMD Spule 22nH	SMD coil 22nH
L225	45681	SMD Spule 470nH	SMD coil 470nH
L227	45681	SMD Spule 470nH	SMD coil 470nH
L228A	45685	SMD Luftspule 12,5nH 574-702MHz	SMD air core coil 12.5nH 574-702MHz
L228B	45725	SMD Luftspule 8nH 678-960MHz	SMD air core coil 8nH 678-960MHz
L229	45681	SMD Spule 470nH	SMD coil 470nH
Q001	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q002	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q003	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q004	32881	Transistor BFS19 SOT23	Transistor BFS19 SOT23
Q005	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q006	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q007	32881	Transistor BFS19 SOT23	Transistor BFS19 SOT23
Q101	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143

POS	IDENT	BEZEICHNUNG	DESCRIPTION
Q102	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q103	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q104	32881	Transistor BFS19 SOT23	Transistor BFS19 SOT23
Q105	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q106	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q107	32881	Transistor BFS19 SOT23	Transistor BFS19 SOT23
Q203	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q204	41278	SMD Transistor BFR93A SOT23	SMD transistor BFR93A SOT23
Q205	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q206	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q207	32881	Transistor BFS19 SOT23	Transistor BFS19 SOT23
Q208	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q209	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q211	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q212	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q335	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q345	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q400	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q410	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q433	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q434	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q435	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q436	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
R001	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R002	45128	SMD Widerstand 220R 5% 0603 (MOQ:50x)	SMD resistor 220R 5% 0603 (MOQ:50x)
R003	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R005	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R006	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R010	45128	SMD Widerstand 220R 5% 0603 (MOQ:50x)	SMD resistor 220R 5% 0603 (MOQ:50x)
R011	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R012	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R013	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R014	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R020	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R021	45214	SMD Widerstand 5k6 5% 0603 (MOQ:50x)	SMD resistor 5k6 5% 0603 (MOQ:50x)
R022	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R023	45130	SMD Widerstand 470R 5% 0603 (MOQ:50x)	SMD resistor 470R 5% 0603 (MOQ:50x)
R024	45122	SMD Widerstand 22R 5% 0603 (MOQ:50x)	SMD resistor 22R 5% 0603 (MOQ:50x)
R025	45125	SMD Widerstand 68R 5% 0603 (MOQ:50x)	SMD resistor 68R 5% 0603 (MOQ:50x)
R026	45125	SMD Widerstand 68R 5% 0603 (MOQ:50x)	SMD resistor 68R 5% 0603 (MOQ:50x)
R027	45130	SMD Widerstand 470R 5% 0603 (MOQ:50x)	SMD resistor 470R 5% 0603 (MOQ:50x)
R028	45214	SMD Widerstand 5k6 5% 0603 (MOQ:50x)	SMD resistor 5k6 5% 0603 (MOQ:50x)
R029	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R040	45122	SMD Widerstand 22R 5% 0603 (MOQ:50x)	SMD resistor 22R 5% 0603 (MOQ:50x)
R041	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R042	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R043	45126	SMD Widerstand 100R 5% 0603 (MOQ:50x)	SMD resistor 100R 5% 0603 (MOQ:50x)
R045	45220	SMD Widerstand 56k 5% 0603 (MOQ:50x)	SMD resistor 56k 5% 0603 (MOQ:50x)
R046	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R047	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R048	45133	SMD Widerstand 3k3 5% 0603 (MOQ:50x)	SMD resistor 3k3 5% 0603 (MOQ:50x)
R049	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R050	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R051	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R052	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R053	45128	SMD Widerstand 220R 5% 0603 (MOQ:50x)	SMD resistor 220R 5% 0603 (MOQ:50x)
R054	45130	SMD Widerstand 470R 5% 0603 (MOQ:50x)	SMD resistor 470R 5% 0603 (MOQ:50x)
R055	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R056	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R057	45207	SMD Widerstand 390R 5% 0603 (MOQ:50x)	SMD Widerstand 390R 5% 0603 (MOQ:50x)
R058	45122	SMD Widerstand 22R 5% 0603 (MOQ:50x)	SMD resistor 22R 5% 0603 (MOQ:50x)
R060	45207	SMD Widerstand 390R 5% 0603 (MOQ:50x)	SMD Widerstand 390R 5% 0603 (MOQ:50x)
R061	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R062	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R063	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R064	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R065	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R101	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R102	45128	SMD Widerstand 220R 5% 0603 (MOQ:50x)	SMD resistor 220R 5% 0603 (MOQ:50x)
R103	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R105	45122	SMD Widerstand 22R 5% 0603 (MOQ:50x)	SMD resistor 22R 5% 0603 (MOQ:50x)
R106	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R110	45128	SMD Widerstand 220R 5% 0603 (MOQ:50x)	SMD resistor 220R 5% 0603 (MOQ:50x)

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R111	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R112	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R113	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R114	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R120	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R121	45214	SMD Widerstand 5k6 5% 0603 (MOQ:50x)	SMD resistor 5k6 5% 0603 (MOQ:50x)
R122	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R123	45130	SMD Widerstand 470R 5% 0603 (MOQ:50x)	SMD resistor 470R 5% 0603 (MOQ:50x)
R124	45122	SMD Widerstand 22R 5% 0603 (MOQ:50x)	SMD resistor 22R 5% 0603 (MOQ:50x)
R125	45125	SMD Widerstand 68R 5% 0603 (MOQ:50x)	SMD resistor 68R 5% 0603 (MOQ:50x)
R126	45125	SMD Widerstand 68R 5% 0603 (MOQ:50x)	SMD resistor 68R 5% 0603 (MOQ:50x)
R127	45130	SMD Widerstand 470R 5% 0603 (MOQ:50x)	SMD resistor 470R 5% 0603 (MOQ:50x)
R128	45214	SMD Widerstand 5k6 5% 0603 (MOQ:50x)	SMD resistor 5k6 5% 0603 (MOQ:50x)
R129	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R140	45122	SMD Widerstand 22R 5% 0603 (MOQ:50x)	SMD resistor 22R 5% 0603 (MOQ:50x)
R141	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R142	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R143	45126	SMD Widerstand 100R 5% 0603 (MOQ:50x)	SMD resistor 100R 5% 0603 (MOQ:50x)
R145	45220	SMD Widerstand 56k 5% 0603 (MOQ:50x)	SMD resistor 56k 5% 0603 (MOQ:50x)
R146	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R147	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R148	45133	SMD Widerstand 3k3 5% 0603 (MOQ:50x)	SMD resistor 3k3 5% 0603 (MOQ:50x)
R149	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R150	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R151	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R152	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R153	45128	SMD Widerstand 220R 5% 0603 (MOQ:50x)	SMD resistor 220R 5% 0603 (MOQ:50x)
R154	45130	SMD Widerstand 470R 5% 0603 (MOQ:50x)	SMD resistor 470R 5% 0603 (MOQ:50x)
R155	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R156	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R157	45207	SMD Widerstand 390R 5% 0603 (MOQ:50x)	SMD Widerstand 390R 5% 0603 (MOQ:50x)
R158	45122	SMD Widerstand 22R 5% 0603 (MOQ:50x)	SMD resistor 22R 5% 0603 (MOQ:50x)
R160	45207	SMD Widerstand 390R 5% 0603 (MOQ:50x)	SMD Widerstand 390R 5% 0603 (MOQ:50x)
R161	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R162	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R163	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R164	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R165	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R201	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R202	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R203	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R204	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R205	45122	SMD Widerstand 22R 5% 0603 (MOQ:50x)	SMD resistor 22R 5% 0603 (MOQ:50x)
R206	45122	SMD Widerstand 22R 5% 0603 (MOQ:50x)	SMD resistor 22R 5% 0603 (MOQ:50x)
R207	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R211	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R212	45136	SMD Widerstand 4k7 5% 0603 (MOQ:50x)	SMD resistor 4k7 5% 0603 (MOQ:50x)
R213	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R214A	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x) 574-814MHz	SMD resistor 10R 5% 0603 (MOQ:50x) 574-814MHz
R214B	45203	SMD Widerstand 4R7 10% 0603 (MOQ:50x) 798-960MHz	SMD resistor 4R7 10% 0603 (MOQ:50x) 798-960MHz
R215A	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x) 574-702MHz	SMD resistor 2k2 5% 0603 (MOQ:50x) 574-702MHz
R215B	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x) 678-960MHz	SMD resistor 1k 5% 0603 (MOQ:50x) 678-960MHz
R216	45285	SMD Widerstand 56R 5% 0603 (MOQ:50x)	SMD resistor 56R 5% 0603 (MOQ:50x)
R218	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R221	45135	SMD Widerstand 3k3 5% 0603 (MOQ:50x)	SMD resistor 3k3 5% 0603 (MOQ:50x)
R222	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R223	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R224	45123	SMD Widerstand 33R 5% 0603 (MOQ:50x)	SMD resistor 33R 5% 0603 (MOQ:50x)
R227	45284	SMD Widerstand 39R 5% 0603 (MOQ:50x)	SMD resistor 39R 5% 0603 (MOQ:50x)
R228	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R229	45130	SMD Widerstand 470R 5% 0603 (MOQ:50x)	SMD resistor 470R 5% 0603 (MOQ:50x)
R233	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R240	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R241	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R242	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R243	45128	SMD Widerstand 220R 5% 0603 (MOQ:50x)	SMD resistor 220R 5% 0603 (MOQ:50x)
R249	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R250	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R251	45146	SMD Widerstand 220k 5% 0603 (MOQ:50x)	SMD resistor 220k 5% 0603 (MOQ:50x)

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R252	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R253	45130	SMD Widerstand 470R 5% 0603 (MOQ:50x)	SMD resistor 470R 5% 0603 (MOQ:50x)
R254	45150	SMD Widerstand 1M 5% 0603 (MOQ:50x)	SMD resistor 1M 5% 0603 (MOQ:50x)
R255	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R256	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R257	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R258	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R260	45146	SMD Widerstand 220k 5% 0603 (MOQ:50x) 574-702MHz	SMD resistor 220k 5% 0603 (MOQ:50x) 574-702MHz
R261	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R262	45146	SMD Widerstand 220k 5% 0603 (MOQ:50x) 678-814MHz	SMD resistor 220k 5% 0603 (MOQ:50x) 678-814MHz
R263	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x) 798-960MHz	SMD resistor 100k 5% 0603 (MOQ:50x) 798-960MHz
R264	45148	SMD Widerstand 470k 5% 0603 (MOQ:50x)	SMD resistor 470k 5% 0603 (MOQ:50x)
R265	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R266	45148	SMD Widerstand 470k 5% 0603 (MOQ:50x)	SMD resistor 470k 5% 0603 (MOQ:50x)
R267	45148	SMD Widerstand 470k 5% 0603 (MOQ:50x)	SMD resistor 470k 5% 0603 (MOQ:50x)
R269	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R288	45120	SMD Widerstand 10R 5% 0603 (MOQ:50x)	SMD resistor 10R 5% 0603 (MOQ:50x)
R290	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R291	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R292	45129	SMD Widerstand 330R 5% 0603 (MOQ:50x)	SMD resistor 330R 5% 0603 (MOQ:50x)
R293	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R294	45135	SMD Widerstand 3k3 5% 0603 (MOQ:50x)	SMD resistor 3k3 5% 0603 (MOQ:50x)
R295	45145	SMD Widerstand 150k 5% 0603 (MOQ:50x)	SMD resistor 150k 5% 0603 (MOQ:50x)
R296	34461	SMD Widerstand 1k 1% 0204 (MOQ:50x)	SMD resistor 1k 1% 0204 (MOQ:50x)
R300	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R301	45214	SMD Widerstand 5k6 5% 0603 (MOQ:50x)	SMD resistor 5k6 5% 0603 (MOQ:50x)
R302	45003	SMD Trimmwiderstand 50k	SMD resistor, variable 50k
R303	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R305	45220	SMD Widerstand 56k 5% 0603 (MOQ:50x)	SMD resistor 56k 5% 0603 (MOQ:50x)
R306	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R307	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R308	45214	SMD Widerstand 5k6 5% 0603 (MOQ:50x)	SMD resistor 5k6 5% 0603 (MOQ:50x)
R309	45003	SMD Trimmwiderstand 50k	SMD resistor, variable 50k
R310	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R311	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R312	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R313	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R315	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R316	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R317	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R318	45141	SMD Widerstand 33k 5% 0603 (MOQ:50x)	SMD resistor 33k 5% 0603 (MOQ:50x)
R319	45145	SMD Widerstand 150k 5% 0603 (MOQ:50x)	SMD resistor 150k 5% 0603 (MOQ:50x)
R320	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R321	40343	SMD Widerstand MELF 2k21 1% 0204 (MOQ:50x)	SMD resistor MELF 2k21 1% 0204 (MOQ:50x)
R322	45145	SMD Widerstand 150k 5% 0603 (MOQ:50x)	SMD resistor 150k 5% 0603 (MOQ:50x)
R323	45141	SMD Widerstand 33k 5% 0603 (MOQ:50x)	SMD resistor 33k 5% 0603 (MOQ:50x)
R324	45143	SMD Widerstand 68k 5% 0603 (MOQ:50x)	SMD resistor 68k 5% 0603 (MOQ:50x)
R325	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R326	37202	SMD Widerstand MELF 33k2 1% 0204 (MOQ:50x)	SMD resistor MELF 33k2 1% 0204 (MOQ:50x)
R327	34463	SMD Widerstand MELF 10k 1% 0204 (MOQ:50x)	SMD resistor MELF 10k 1% 0204 (MOQ:50x)
R328	45153	SMD Widerstand 10M 10% 0603 (MOQ:50x)	SMD resistor 10M 10% 0603 (MOQ:50x)
R329	45153	SMD Widerstand 10M 10% 0603 (MOQ:50x)	SMD resistor 10M 10% 0603 (MOQ:50x)
R330	45216	SMD Widerstand 12k 5% 0603 (MOQ:50x)	SMD resistor 12k 5% 0603 (MOQ:50x)
R331	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R332	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R333	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R334	40479	MELF Widerstand 68k1 1% 0204 (MOQ:50x)	MELF resistor 68k1 1% 0204 (MOQ:50x)
R335	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R336	37201	SMD Widerstand MELF 22k1 1% 0204 (MOQ:50x)	SMD resistor MELF 22k1 1% 0204 (MOQ:50x)
R337	41234	Potentiometer 2k5	Potentiometer 2k5
R338	45126	SMD Widerstand 100R 5% 0603 (MOQ:50x)	SMD resistor 100R 5% 0603 (MOQ:50x)
R339	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R340	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R341	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R342	45124	SMD Widerstand 47R 5% 0603 (MOQ:50x)	SMD resistor 47R 5% 0603 (MOQ:50x)
R343	45136	SMD Widerstand 4k7 5% 0603 (MOQ:50x)	SMD resistor 4k7 5% 0603 (MOQ:50x)
R344	45136	SMD Widerstand 4k7 5% 0603 (MOQ:50x)	SMD resistor 4k7 5% 0603 (MOQ:50x)
R345	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R346	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R347	45126	SMD Widerstand 100R 5% 0603 (MOQ:50x)	SMD resistor 100R 5% 0603 (MOQ:50x)

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R348	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R349	45126	SMD Widerstand 100R 5% 0603 (MOQ:50x)	SMD resistor 100R 5% 0603 (MOQ:50x)
R350	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R351	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R352	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R353	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R355	45141	SMD Widerstand 33k 5% 0603 (MOQ:50x)	SMD resistor 33k 5% 0603 (MOQ:50x)
R356	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R357	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R358	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R361	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R362	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R363	45139	SMD Widerstand 15k 5% 0603 (MOQ:50x)	SMD resistor 15k 5% 0603 (MOQ:50x)
R364	45139	SMD Widerstand 15k 5% 0603 (MOQ:50x)	SMD resistor 15k 5% 0603 (MOQ:50x)
R366	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R367	45141	SMD Widerstand 33k 5% 0603 (MOQ:50x)	SMD resistor 33k 5% 0603 (MOQ:50x)
R368	45150	SMD Widerstand 1M 5% 0603 (MOQ:50x)	SMD resistor 1M 5% 0603 (MOQ:50x)
R369	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R370	45300	SMD Trimmwiderstand 10k (MOQ:50x)	SMD resistor, variable 10k (MOQ:50x)
R371	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R372	45300	SMD Trimmwiderstand 10k (MOQ:50x)	SMD resistor, variable 10k (MOQ:50x)
R373	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R374	45146	SMD Widerstand 220k 5% 0603 (MOQ:50x)	SMD resistor 220k 5% 0603 (MOQ:50x)
R375	45146	SMD Widerstand 220k 5% 0603 (MOQ:50x)	SMD resistor 220k 5% 0603 (MOQ:50x)
R376	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R377	45300	SMD Trimmwiderstand 10k (MOQ:50x)	SMD resistor, variable 10k (MOQ:50x)
R378	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R379	45146	SMD Widerstand 220k 5% 0603 (MOQ:50x)	SMD resistor 220k 5% 0603 (MOQ:50x)
R380	45300	SMD Trimmwiderstand 10k (MOQ:50x)	SMD resistor, variable 10k (MOQ:50x)
R381	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R382	45146	SMD Widerstand 220k 5% 0603 (MOQ:50x)	SMD resistor 220k 5% 0603 (MOQ:50x)
R383	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R385	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R386	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R387	45212	SMD Widerstand 2k7 5% 0603 (MOQ:50x)	SMD Widerstand 2k7 5% 0603 (MOQ:50x)
R388	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R389	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R393	45151	SMD Widerstand 2M2 10% 0603 (MOQ:50x)	SMD resistor 2M2 10% 0603 (MOQ:50x)
R394	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R395	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R396	45153	SMD Widerstand 10M 10% 0603 (MOQ:50x)	SMD resistor 10M 10% 0603 (MOQ:50x)
R397	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R398	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R400	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R401	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R402	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R403	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R404	45153	SMD Widerstand 10M 10% 0603 (MOQ:50x)	SMD resistor 10M 10% 0603 (MOQ:50x)
R405	45136	SMD Widerstand 4k7 5% 0603 (MOQ:50x)	SMD resistor 4k7 5% 0603 (MOQ:50x)
R406	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R407	37200	SMD Widerstand MELF 332R 1% 0204 (MOQ:50x)	SMD resistor MELF 332R 1% 0204 (MOQ:50x)
R408	37200	SMD Widerstand MELF 332R 1% 0204 (MOQ:50x)	SMD resistor MELF 332R 1% 0204 (MOQ:50x)
R409	37200	SMD Widerstand MELF 332R 1% 0204 (MOQ:50x)	SMD resistor MELF 332R 1% 0204 (MOQ:50x)
R410	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R420	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R421	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R422	45144	SMD Widerstand 100k 5% 0603 (MOQ:50x)	SMD resistor 100k 5% 0603 (MOQ:50x)
R423	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R424	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R425	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R426	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R427	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R428	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R429	45140	SMD Widerstand 22k 5% 0603 (MOQ:50x)	SMD resistor 22k 5% 0603 (MOQ:50x)
R431	45126	SMD Widerstand 100R 5% 0603 (MOQ:50x)	SMD resistor 100R 5% 0603 (MOQ:50x)
R433	45285	SMD Widerstand 56R 5% 0603 (MOQ:50x)	SMD resistor 56R 5% 0603 (MOQ:50x)
R434	45285	SMD Widerstand 56R 5% 0603 (MOQ:50x)	SMD resistor 56R 5% 0603 (MOQ:50x)
R435	45285	SMD Widerstand 56R 5% 0603 (MOQ:50x)	SMD resistor 56R 5% 0603 (MOQ:50x)
R436	45285	SMD Widerstand 56R 5% 0603 (MOQ:50x)	SMD resistor 56R 5% 0603 (MOQ:50x)
R437	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R440	45133	SMD Widerstand 3k3 5% 0603 (MOQ:50x)	SMD resistor 3k3 5% 0603 (MOQ:50x)
R441	45132	SMD Widerstand 1k 5% 0603 (MOQ:50x)	SMD resistor 1k 5% 0603 (MOQ:50x)
R442	45211	SMD Widerstand 1k8 5% 0603 (MOQ:50x)	SMD resistor 1k8 5% 0603 (MOQ:50x)

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R443	45135	SMD Widerstand 3k3 5% 0603 (MOQ:50x)	SMD resistor 3k3 5% 0603 (MOQ:50x)
R444	45214	SMD Widerstand 5k6 5% 0603 (MOQ:50x)	SMD resistor 5k6 5% 0603 (MOQ:50x)
R445	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R446	45138	SMD Widerstand 10k 5% 0603 (MOQ:50x)	SMD resistor 10k 5% 0603 (MOQ:50x)
R447	45216	SMD Widerstand 12k 5% 0603 (MOQ:50x)	SMD resistor 12k 5% 0603 (MOQ:50x)
R448	45220	SMD Widerstand 56k 5% 0603 (MOQ:50x)	SMD resistor 56k 5% 0603 (MOQ:50x)
R450	45215	SMD Widerstand 8k2 5% 0603 (MOQ:50x)	SMD resistor 8k2 5% 0603 (MOQ:50x)
R451	45295	SMD Widerstand 0R 0603 (MOQ:50x)	SMD resistor 0R 0603 (MOQ:50x)
R452	45212	SMD Widerstand 2k7 5% 0603 (MOQ:50x)	SMD Widerstand 2k7 5% 0603 (MOQ:50x)
R453	45134	SMD Widerstand 2k2 5% 0603 (MOQ:50x)	SMD resistor 2k2 5% 0603 (MOQ:50x)
R454	45135	SMD Widerstand 3k3 5% 0603 (MOQ:50x)	SMD resistor 3k3 5% 0603 (MOQ:50x)
R455	45135	SMD Widerstand 3k3 5% 0603 (MOQ:50x)	SMD resistor 3k3 5% 0603 (MOQ:50x)
R456	45135	SMD Widerstand 3k3 5% 0603 (MOQ:50x)	SMD resistor 3k3 5% 0603 (MOQ:50x)
R457	45212	SMD Widerstand 2k7 5% 0603 (MOQ:50x)	SMD Widerstand 2k7 5% 0603 (MOQ:50x)
R458	45142	SMD Widerstand 47k 5% 0603 (MOQ:50x)	SMD resistor 47k 5% 0603 (MOQ:50x)
R503	34461	SMD Widerstand 1k 1% 0204 (MOQ:50x) 574-702MHz	SMD resistor 1k 1% 0204 (MOQ:50x) 574-702MHz
R504	34461	SMD Widerstand 1k 1% 0204 (MOQ:50x) 678-814MHz	SMD resistor 1k 1% 0204 (MOQ:50x) 678-814MHz
R505	34461	SMD Widerstand 1k 1% 0204 (MOQ:50x) 798-960MHz	SMD resistor 1k 1% 0204 (MOQ:50x) 798-960MHz
S001	45370	Codierschalter	Code switch
S002	45677	Druckschalter	Press switch
T001	46337	HF-Transformator 72MHz	RF transformer 72MHz
T002	46337	HF-Transformator 72MHz	RF transformer 72MHz
T003	46338	HF-Transformator 40MHz	RF transformer 40MHz
T004	46337	HF-Transformator 72MHz	RF transformer 72MHz
T101	46337	HF-Transformator 72MHz	RF transformer 72MHz
T102	46337	HF-Transformator 72MHz	RF transformer 72MHz
T103	46338	HF-Transformator 40MHz	RF transformer 40MHz
TR001	45428	SMD-Baluntransformator	SMD balun transformer
TR002	45428	SMD-Baluntransformator	SMD balun transformer
TR101	45428	SMD-Baluntransformator	SMD balun transformer
TR102	45428	SMD-Baluntransformator	SMD balun transformer
U001	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U002	45699	SMD IC FM ZF+DEMOD TDA1576T	SMD IC FM ZF+DEMOD TDA1576T
U003	45715	SMD IC EEPROM 1K	SMD IC EEPROM 1K
U004	45711	SMD IC PLL CMOS TBB206G	SMD IC PLL CMOS TBB206G
U005	45508	SMD IC NE701D SO8	SMD IC NE701D SO8
U006	45710	SMD MCU+AD 8BIT	SMD MCU+AD 8BIT
U007	45709	SMD IC 78L05-0/70	SMD IC 78L05-0/70
U008	45707	IC 7808-0/70 TO220	IC 7808-0/70 TO220
U009	40099	SMD IC TL072CD SO8	SMD IC TL072CD SO8
U010	45037	IC HCMOS 74HC4066	IC HCMOS 74HC4066
U011	40099	SMD IC TL072CD SO8	SMD IC TL072CD SO8
U012	45093	SMD IC NE572D SOL16	SMD IC NE572D SOL16
U013	41277	SMD IC MC33078D SO8 SUP8	SMD IC MC33078D SO8 SUP8
U014	40099	SMD IC TL072CD SO8	SMD IC TL072CD SO8
U015	29114	IC 358-S08-0/70	IC 358-S08-0/70
U016	32249	IC 339	IC 339
U017	29114	IC 358-S08-0/70	IC 358-S08-0/70
U018	32249	IC 339	IC 339
U019	32249	IC 339	IC 339
U020	32249	IC 339	IC 339
U021	32249	IC 339	IC 339
U022	45751	SMD IC RN5VL41AATR	SMD IC RN5VL41AATR
U101	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U102	45699	SMD IC FM ZF+DEMOD TDA1576T	SMD IC FM ZF+DEMOD TDA1576T
Y001	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y002	45703	Quarz 73,450000MHz	Crystal 73.450000MHz
Y003	45716	Quarz 4,000000MHz	Crystal 4.000000MHz
Y101	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
YF001	40588	Keramik-Filter 10,7MHz	Ceramic filter 10.7MHz
YF002	40588	Keramik-Filter 10,7MHz	Ceramic filter 10.7MHz
YF003	40588	Keramik-Filter 10,7MHz	Ceramic filter 10.7MHz
YF101	40588	Keramik-Filter 10,7MHz	Ceramic filter 10.7MHz
YF102	40588	Keramik-Filter 10,7MHz	Ceramic filter 10.7MHz
YF103	40588	Keramik-Filter 10,7MHz	Ceramic filter 10.7MHz

EM 1031-U
03 / 96 - 38

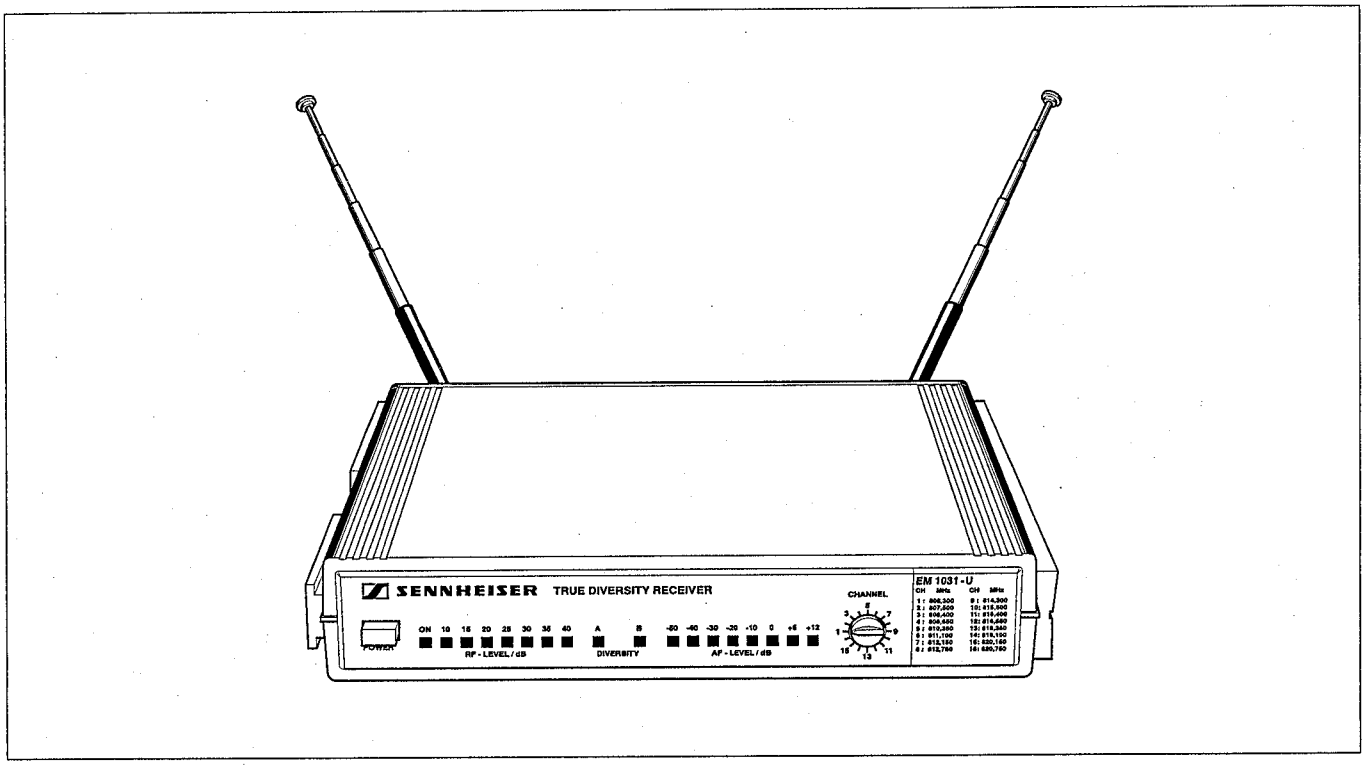
Ident.- Nr. 70529
Printed in Germany

SENNHEISER
Service-Info

SI 980331-03

EM 1031-U

Leiterplattennummer 55745
PCB number 55745



TECHNISCHE ÄNDERUNG EM 1031-U

Der Empfänger EM 1031-U wird in Zukunft in einer fertigungstechnisch modifizierten Version ausgeliefert. Die Empfangsbereiche sind erweitert. Die neue Leiterplatte mit der Leiterplattennummer 55745 fließt ohne Seriennummernsprung in die Fertigung ein.

Heften Sie diese Service-Information zu der entsprechenden Service-Anleitung:

- EM 1031-U (Ersatzteilnummer 70529)

INHALT:

- Stromlaufplan HF-Teil, Tuner
- Stromlaufplan PLL, ZF-Teil
- Stromlaufplan NF-Teil, Anzeige
- Gedruckte Schaltung, Bestückungsseite
- Gedruckte Schaltung, Lötseite

TECHNICAL MODIFICATION EM 1031-U

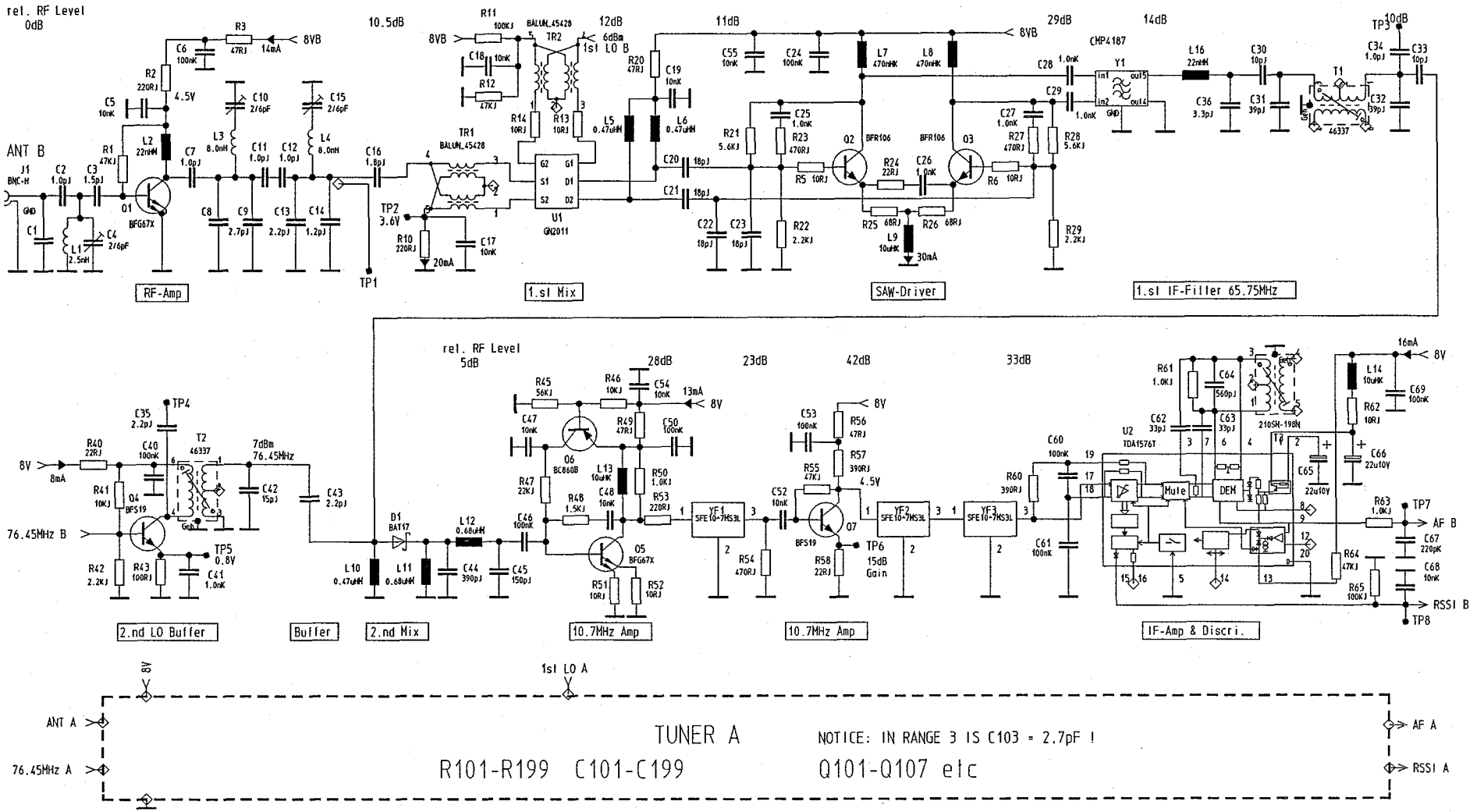
The EM 1031-U receiver will in future be slightly modified: It will contain new frequency ranges and a new printed circuit board, PCB no. 55745. This modification will be implemented without changing the series number.

Please attach this Service-Information close to your Service manual:

- EM 1031-U (Spare part no. 70529)

CONTENTS:

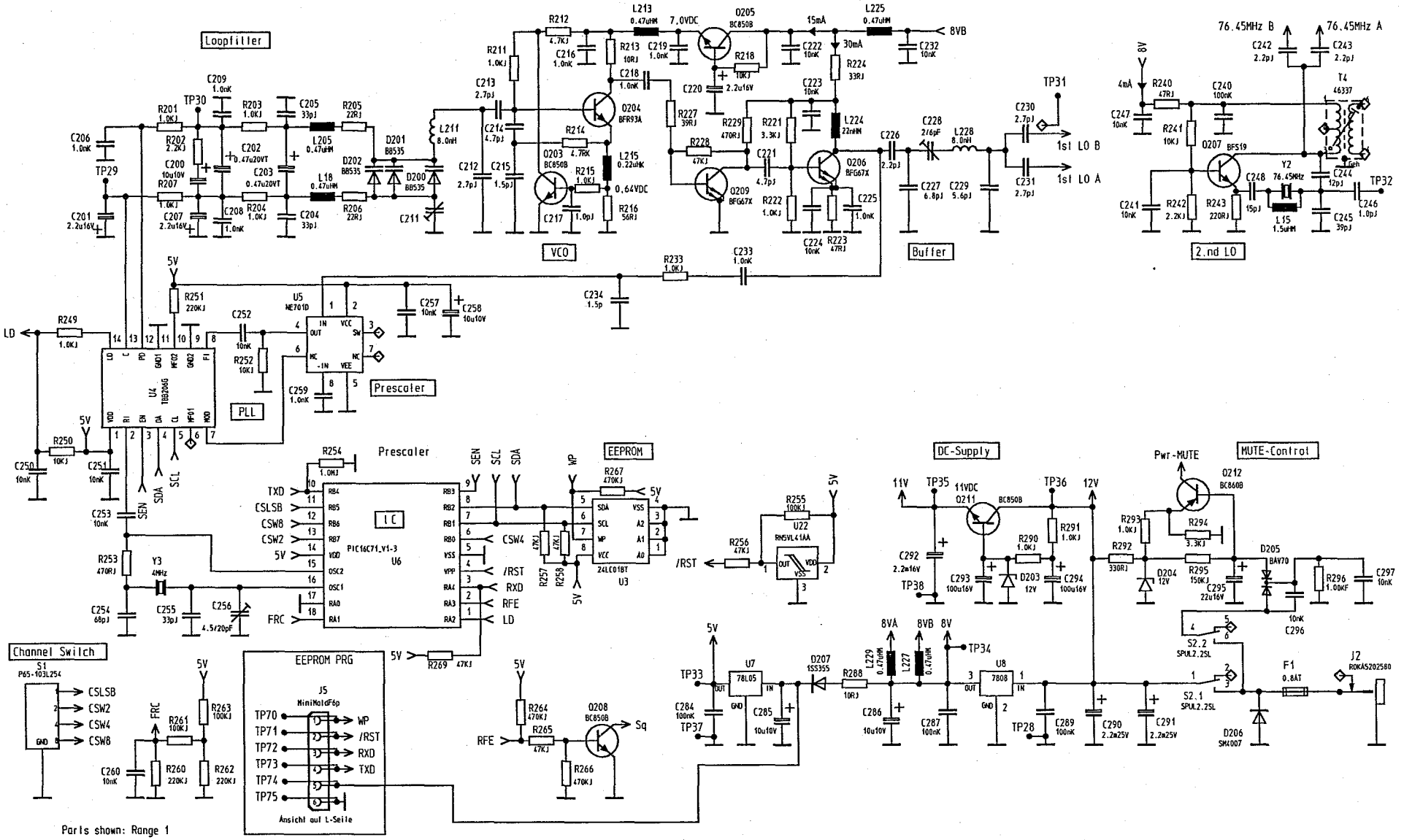
- Circuit diagram RF section, Tuner
- Circuit diagram PLL section, IF section
- Circuit diagram AF section, Meters
- Diagrams of the printed circuit board, component side
- Diagrams of the printed circuit board, solder side



		RF-Amplifier																	Code-Resistors				
No.	Freq. MHz	C1	C2	L1	C3	C4	C7	C8	C9	L3	C10	C11	C12	L4	C13	C14	C15	C16	R501	R502	R503	R504	R505
5	430-494	-	2p7	5n0	2p7	3/10p	3p3	-	3p9	18n5	3/10p	3p3	3p3	18n5	3p9	-	3/10p	3p9	1k	-	-	-	-
4	470-598	-	2p7	2n5	2p7	3/10p	3p3	-	3p3	18n5	3/10p	1p5	1p5	18n5	3p9	-	3/10p	3p9	-	1k	-	-	-
3	574-702	-	2p2	2n5	3p3	3/10p	1p5	2p7	1p5	12n5	3/10p	1p5	1p5	12n5	2p7	2p7	3/10p	1p5	-	-	1k	-	-
2	678-814	-	1p5	2n5	2p2	2/6p	1p5	1p0	1p5	12n5	2/6p	1p5	1p5	12n5	1p5	1p5	2/6p	1p5	-	-	-	1k	-
1	798-960	-	1p0	2n5	1p5	2/6p	1p0	-	2p7	8n0	2/6p	1p0	1p0	8n0	2p2	1p2	2/6p	1p8	-	-	-	-	1k

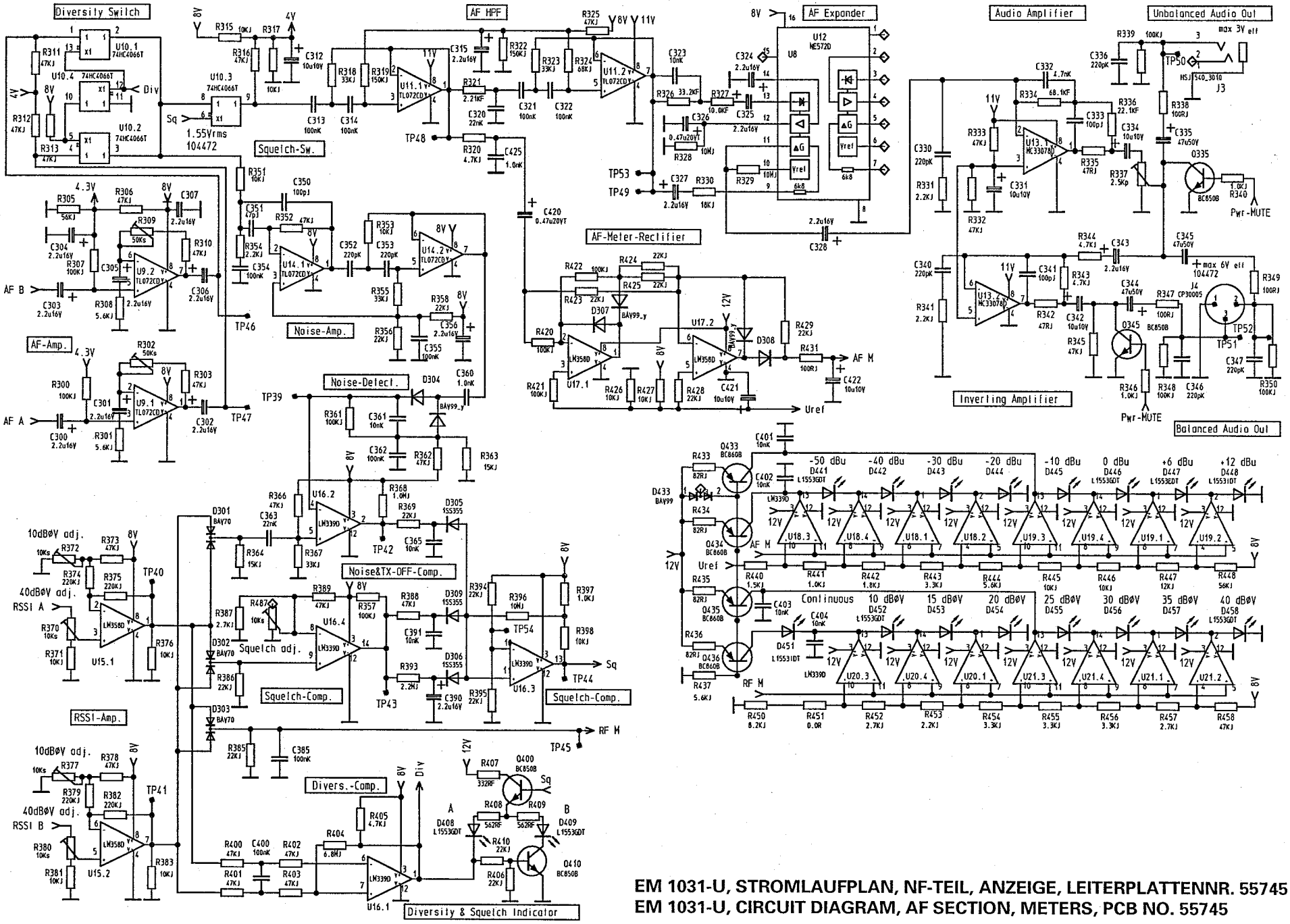
Parts shown: Range 1

EM 1031-U, STROMLAUFPLAN, HF-TEIL, TUNER, LEITERPLATTENNR. 55745
EM 1031-U, CIRCUIT DIAGRAM, RF SECTION, TUNER, PCB NO. 55745

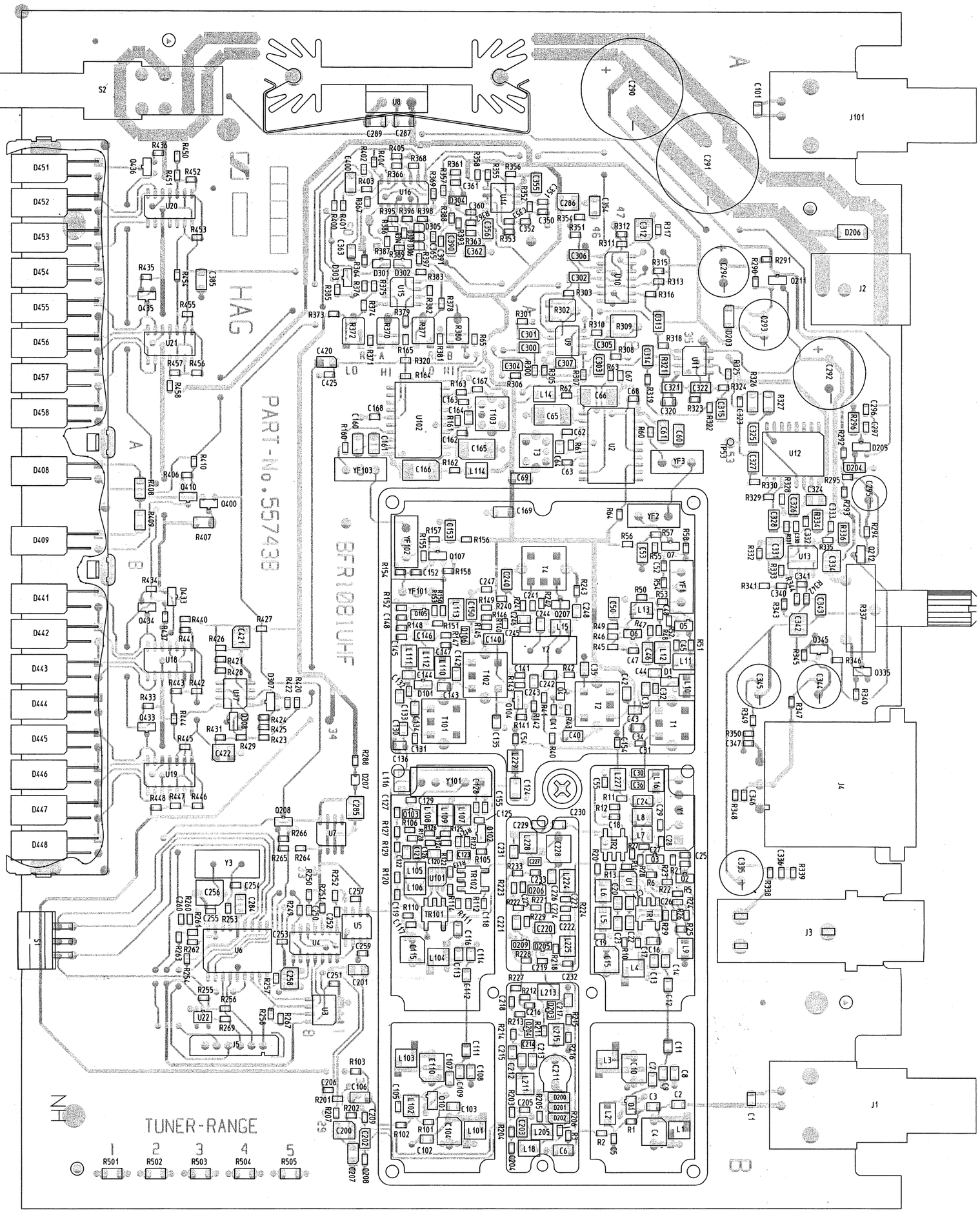


No.	Freq. MHz	VCO										BUFFER								IC Range				
		L205	L18	L211	C211	C212	C213	C214	C215	C217	R214	R215	C221	C226	C227	C228	L228	C229	C230	C231	R260	R262	R263	D201	D202
5	430-494	46559	46559	18n5	4.5/20	10p	4p7	6p8	3p9	-	10R	2K2	4p7	3p3	10p	4.5/20	12n5	10p	6p8	6p8	220k	-	-	BB535	-
4	470-598	46559	46559	18n5	4.5/20	10p	4p7	6p8	3p9	-	10R	2K2	4p7	3p3	10p	4.5/20	12n5	10p	6p8	6p8	220k	220k	100k	-	-
3	574-702	46559	46559	18n5	3/10p	4p7	3p9	6p8	3p3	-	10R	2K2	4p7	2p7	8p2	3/10p	12n5	8p2	5p6	5p6	220k	-	100k	-	-
2	678-814	46559	46559	12n5	3/10p	4p7	3p3	4p7	1p8	-	10R	1K0	4p7	3p3	8p2	3/10p	8n0	10p	4p7	8p2	-	220k	100k	-	-
1	798-960	45681	45681	8n0	3/10p	2p7	2p7	4p7	1p5	-	4R7	1K0	4p7	2p2	6p8	2/6p	8n0	5p6	2p7	2p7	-	-	100k	-	-

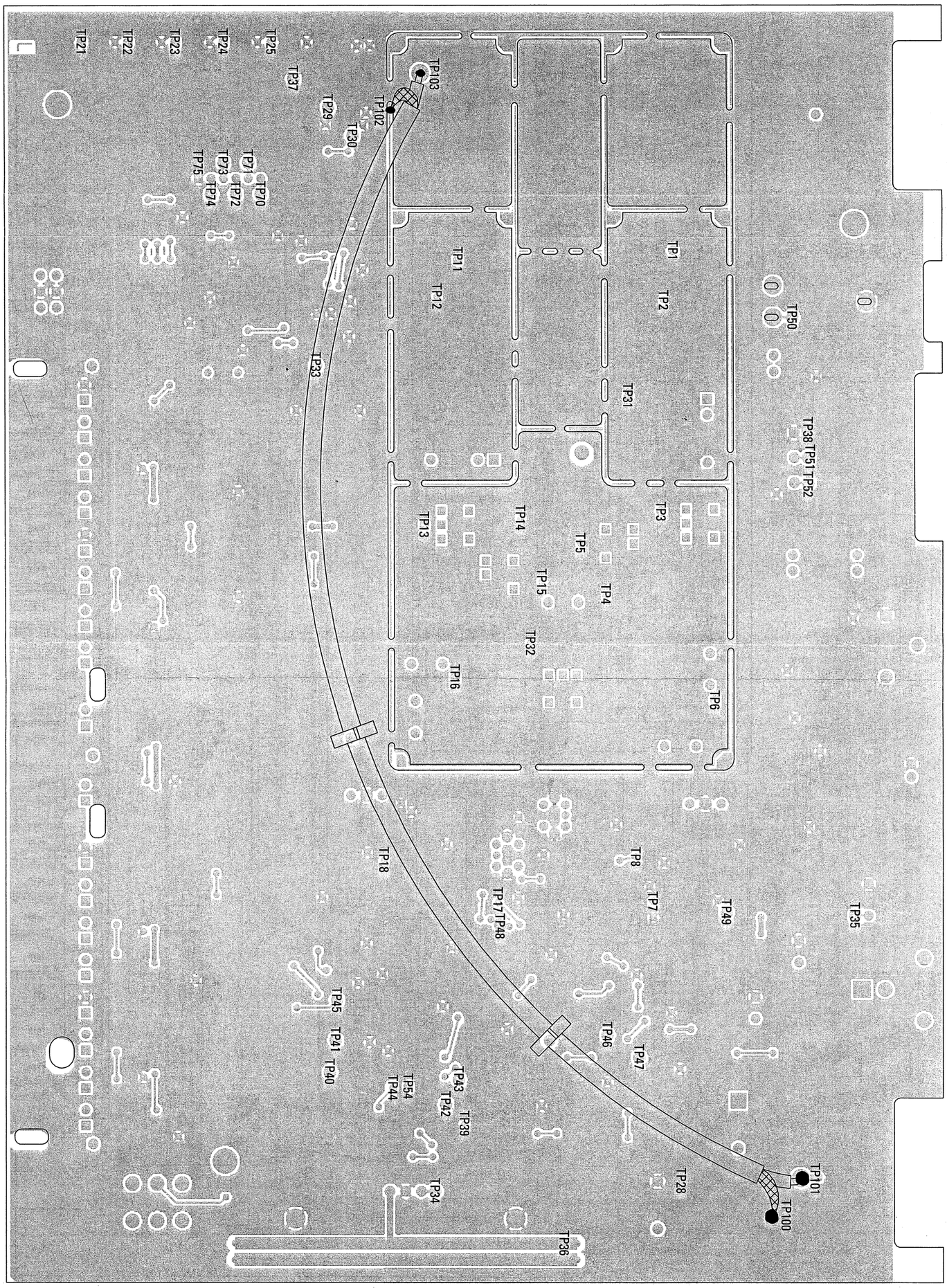
EM 1031-U, STROMLAUFPLAN, PLL, ZF-TEIL, LEITERPLATTENNR. 55745
EM 1031-U, CIRCUIT DIAGRAM, PLL SECTION, IF SECTION, PCB NO. 55745



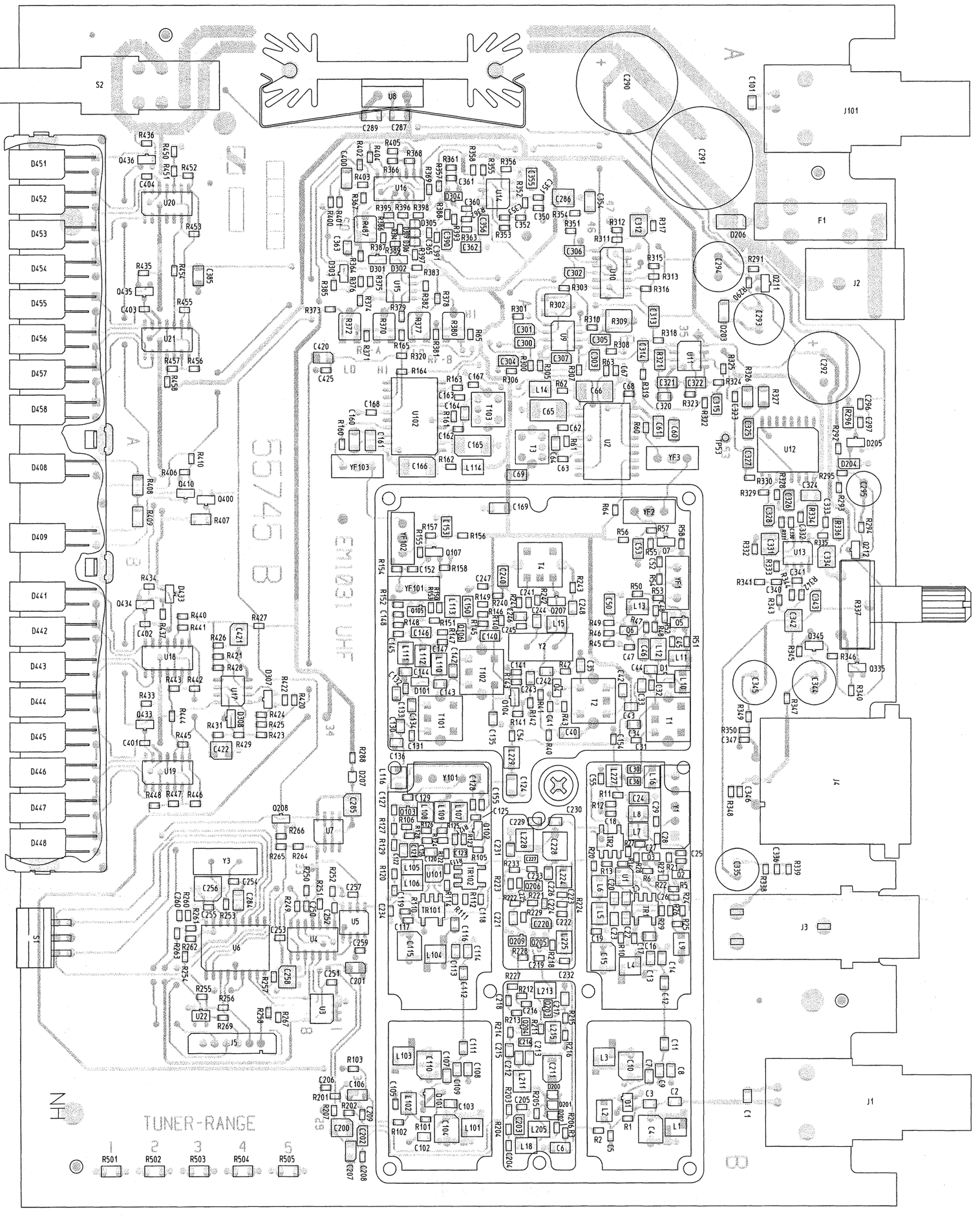
EM 1031-U, STROMLAUFPLAN, NF-TEIL, ANZEIGE, LEITERPLATTENNR. 55745
EM 1031-U, CIRCUIT DIAGRAM, AF SECTION, METERS, PCB NO. 55745



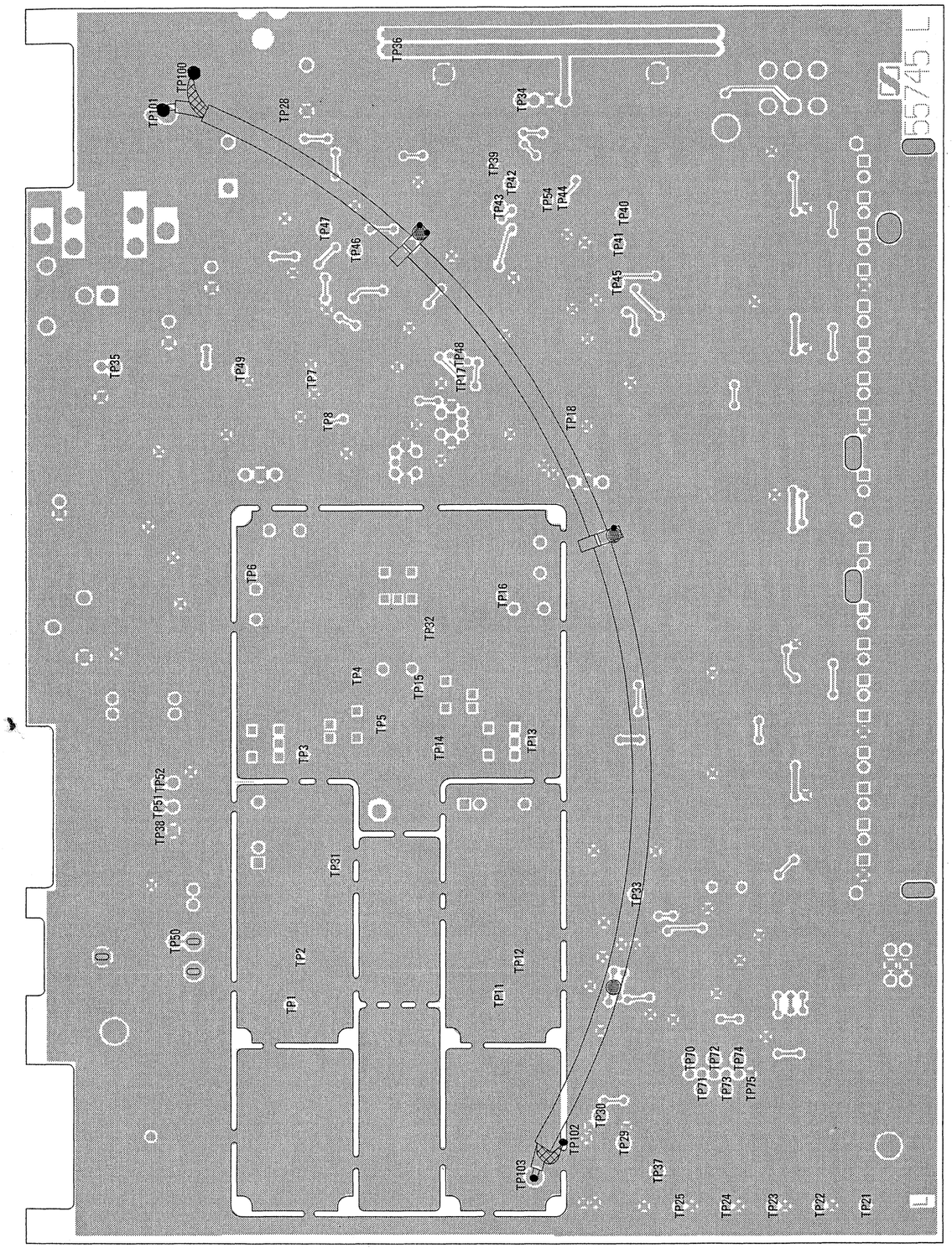
EM 1031-U, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE
EM 1031-U, PRINTED CIRCUIT BOARD, COMPONENT SIDE



EM 1031-U, GEDRUCKTE SCHALTUNG, LÖTSEITE
EM 1031-U, PRINTED CIRCUIT BOARD, SOLDER SIDE



EM 1031-U, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE, LEITERPLATTENNR. 55745
EM 1031-U, PRINTED CIRCUIT BOARD, COMPONENT SIDE, PCB NO. 55745



EM 1031-U, GEDRUCKTE SCHALTUNG, LÖTSEITE, LEITERPLATTENNR. 55745
EM 1031-U, PRINTED CIRCUIT BOARD, SOLDER SIDE, PCB NO. 55745